DOCUMENT RESUME

ED 312 435 CE 053 517

TITLE	Vocational-Technical Program and Course Standards. Competency-Based Postsecondary Curriculum Outlines. Bulletin No. 1822.
INSTITUTION	Louisiana State Dept. of Education, Baton Rouge. Div. of Vocational Education.
PUB DATE	87
NOTE	453p.
PUB TYPE	Guides - Classroom Use - Guides (For Teachers) (052)
EDRS PRICE	MF01/PC19 Plus Postage.
DESCRIPTORS	Accountability; Agricultural Education; Allied Health Occupations; Business Education; Communications; *Competency Based Education; Consumer Education; Distributive Education; Engineering Education; *Evaluation Criteria; Home Economics Education; Postsecondary Education; Program Validation; State Curriculum Guides; *State Standards; Trade and Industrial Education; *Vocational Education
IDENTIFIERS	*Louisiana

ABSTRACT

This document contains required vocational education program and course standards for all vocational and technical education offerings at the postsecondary level in Louisiana. The document consists of an introduction that describes the standards, gives the names and addresses of state department of education personnel and committee members who worked to arrive at the standards, and lists the standards themselves arranged by vocational program area. Those program areas are: agriculture; business; communications; consumer, personal, and miscellaneous services; engineering; health occupations; home economics; and trade and industrial. The standards for each course offered within a program area include: a course title, a Classification of Instructional Programs (CIP) code number, a narrative course description, the course length, the titles of units of instruction, and student competencies for each unit of instruction. (CML)

****
*   Reproductions supplied by EDRS are the best that can be made   *
*   from the original document.   *
****

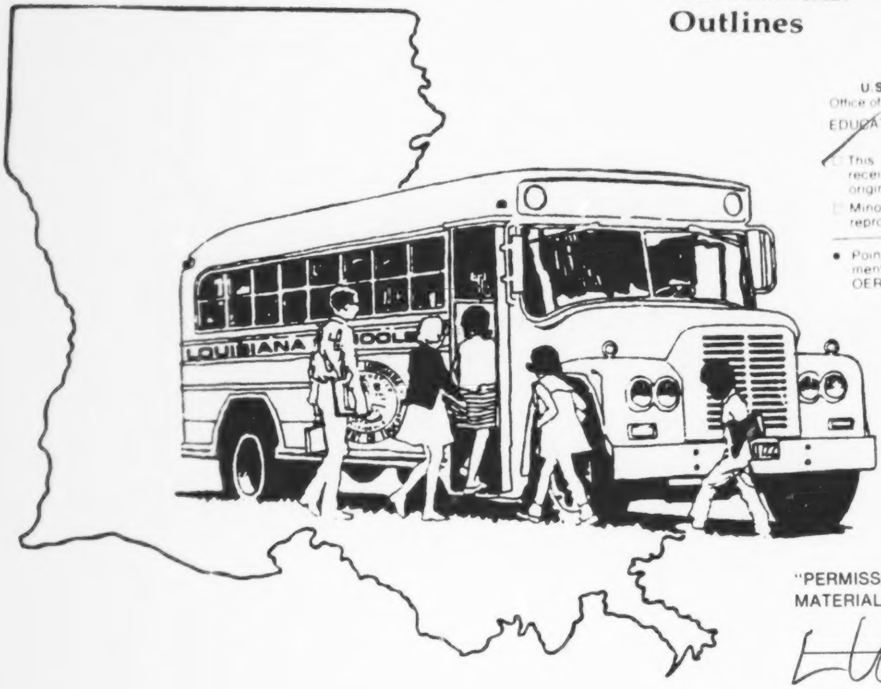
CE

VOCATIONAL-TECHNICAL PROGRAM and COURSE STANDARDS

ED312435

1987
OFFICE OF VOCATIONAL EDUCATION
Bulletin No. 1822

Competency-Based
Postsecondary
Curriculum
Outlines



U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

LOUISIANA DEPARTMENT OF EDUCATION

CE053517

THOMAS G. CLAUSEN, Ph.D.

State Superintendent

BEST COPY AVAILABLE

State of Louisiana

DEPARTMENT OF EDUCATION

VOCATIONAL-TECHNICAL PROGRAM AND COURSE STANDARDS

BULLETIN 1822

COMPETENCY-BASED POSTSECONDARY CURRICULUM OUTLINES

1987

Office of Vocational Education

Elaine Webb, Ed.D.
Assistant Superintendent

Thomas G. Clausen, Ph.D.
State Superintendent

EQUAL OPPORTUNITY STATEMENT

In compliance with Title VI of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, and Section 504 of the Rehabilitation Act of 1973, this educational agency upholds the following policy:

THIS IS AN EQUAL OPPORTUNITY INSTITUTION AND IS DEDICATED TO A POLICY OF NONDISCRIMINATION IN EMPLOYMENT OR TRAINING. QUALIFIED STUDENTS, APPLICANTS OR EMPLOYEES WILL NOT BE EXCLUDED FROM ANY COURSE OR ACTIVITY BECAUSE OF AGE, RACE, CREED, COLOR, SEX, RELIGION, NATIONAL ORIGIN OR QUALIFIED HANDICAP. ALL STUDENTS HAVE EQUAL RIGHTS TO COUNSELING AND TRAINING.

This public document was published at a total cost of $23,688; 1,000 copies of this public document were published in this 1st printing at a cost of $23,688. The total cost of all printings of this document, including reprints is $23,688. This document was published by Louisiana Department of Education, Office of Vocational Education, Post Office Box 94064, Baton Rouge, Louisiana 70804-9064 for the dissemination of Competency-Based Program and Course Standards for Louisiana Vo-Tech Education under authority of Public Law 98-524. This material was printed in accordance with the standards for printing by state agencies established pursuant to R.S. 43.31.

TABLE OF CONTENTS

Foreword i
Acknowledgement ii
Introduction iii
Board of Elementary and Secondary Education iv
Trade and Industrial Education Bureau v
Vocational Curriculum Development & Research Center Curriculum Staff v
Technical Committees 1
Master Listing of Competency-Based Courses 29

Competency-Based Course Outlines

Agriculture

Agricultural Mechanics 31
Forest Technology 43
Horticulture 51

Business

Account Clerk 63
Computer Operator 69
Computer Programmer 73
Hospitality and Tourism 79
Salesmanship 83
Secretary 87
Stenographer 93
Terminal System Operator 99
Word Processor Operator 103

Communications

Television Production 109

Consumer, Personal, and Miscellaneous Services

Barbering 113
Cosmetology 117

Engineering

Biomedical Equipment Technology 121
Civil Engineering Technology 131
Drafting and Design Technology 159
Electromechanical Technology 185
Motor Vessel Engineer 193
Nondestructive Testing 201
Process Technician 207

Health Occupations

Emergency Medical Technician (EMT)—Paramedic 217
Medical Laboratory Technician - Certificate 219
Nurse Assistant 225
Practical Nursing 229
Respiratory Therapy Technician 237
Surgical Technology 243
Ward Clerk 247

Home Economics

Child Care 249
Commercial Sewing 253
Culinary Occupations 257
Dietary Manager 261
Homemaker's Aide 265

Trade and Industrial

Air Conditioning/Refrigeration 269
Appliance Repair 281
Auto Body Repair 287
Automotive Technician 291
Aviation Maintenance Technology 297
Band and Circular Saw Filing 303
Carpentry 307
Commercial Art 311
Communications Electronics 315
Computer Electronics 323
Consumer Electronics Technician 329
Diesel Mechanics 337
Electrician 345
Graphic Arts 351
Heavy Equipment Mechanic 355
Heavy Equipment Operator 361
Industrial Electronics 367
Industrial Machine Shop 375
Industrial Maintenance Technician 379
Instrumentation 387
Jewelry Technology 395
Marine Operations 405
Masonry 413
Meat Processing 417
Office Equipment Repair 423
Outdoor Power Equipment Technician 429
Pipefitting 435
Plumbing 439
Power Line Technician 443
Truck Driving 449
Upholstering 453
Welding 459

FOREWORD

This publication was produced as a result of a project funded by the Louisiana State Department of Education. It is based on extensive research from 37 states nationwide along with the cooperative efforts of over 231 business and industry representatives and 97 vocational education personnel from across Louisiana. The main purpose of the project was to update and develop program and course standards for the postsecondary Vo-Tech System. Competency-based vocational education is one of the best means of preparing persons for entry, advancement or upgrading in occupations.

On behalf of the State Department of Education, sincere appreciation is extended to all who had a part in formulating this document. It is hoped that once these standards are implemented, the ultimate result will be improved programs and better prepared individuals to enter the work force.

Thomas G. Clausen

Thomas G. Clausen, Ph.D.
State Superintendent of Education

ACKNOWLEDGEMENTS

This publication is the result of a two-year joint project conducted by the Office of Vocational Education, Trade and Industrial Education Bureau, and the Vocational Curriculum Development and Research Center. The individual and cooperative efforts of many persons have made this publication a reality.

Special recognition is expressed to David Poston, Director of the Vocational Curriculum Development and Research Center for serving as project director and to his staff for their diligent and dedicated work. Special appreciation is also extended to Dr. Ralph Ainsworth, Director, and to the staff of the Trade and Industrial Education Bureau for their efforts and contributions.

Particular appreciation is extended to the members of the Technical Committees for their time and valuable input and to the many firms which supported their employees' participation in the workshops. Special thanks is also extended to the many directors and instructors of the vocational-technical schools for providing input and support in making this publication possible.

Elaine Webb, Ed.D.
Assistant Superintendent
Office of Vocational Education

INTRODUCTION

This document contains vocational education program and course standards for all vocational-technical education offerings at the postsecondary level as a part of Louisiana's comprehensive vocational-technical education system. Each course standard contains a uniform title, uniform length, CIP code (Classification of Instructional Programs), course description, units of instruction, and unit competency listing.

Though these standards do not dictate specific techniques or instructional methodology, they must be adhered to by schools in planning, implementing, and evaluating vocational courses and programs. The extent to which these standards are adhered forms a primary basis for review and evaluation.

The standards do not prescribe how instruction should be delivered since decisions relative to the delivery of instruction must be made by schools within the context of local conditions. The Office of Vocational Education, Louisiana Department of Education, supports the belief that competency-based vocational education is the most effective means of providing programs and courses that conform to these established standards.

These standards are based on competencies required for entry, advancement, and upgrading in occupations served by the occupational program areas of Agriculture; Business; Communications; Consumer, Personal, and Miscellaneous Services; Engineering; Health Occupations; Home Economics; and Trade and Industrial. The standards are based upon input from business and industry employers, licensing and credentialing agencies, other representatives of the private sector, and representatives from vocational education.

GOVERNING BOARD OF LOUISIANA VOCATIONAL-TECHNICAL EDUCATION

State Board of Elementary and Secondary Education

P. O. Box 94064
Capitol Station
Baton Rouge, LA 70804-9064

BOARD MEMBERS

MR. JESSE H. BANKSTON
6th Congressional District
Baton Rouge

DR. JOHN A. BERTRAND
7th Congressional District
Crowley

BR. FELICIAN FOURRIER, S.C.
Member-at-Large
Baton Rouge

MR. MILTON HAMEL
4th Congressional District
Shreveport

MRS. GLORIA J. HARRISON
Member-at-Large
Shreveport

MRS. MARTHA SCOTT HENRY
Member-at-Large
Monroe

MR. KEITH JOHNSON
2nd Congressional District
New Orleans

REV. LIONEL JOHNSON
8th Congressional District
Plaquemine

DR. CLAIRE R. LANDRY
1st Congressional District
Arabi

MR. JACK PELLEGRIN
3rd Congressional District
Houma

MRS. MARIE LOUISE SNELLINGS
5th Congressional District
Monroe

STATE DEPARTMENT OF EDUCATION

TRADE AND INDUSTRIAL EDUCATION BUREAU

RALPH S. AINSWORTH, Ed.D
Director

C. RAYMOND BELL, JR.
Assistant Director

CLEVELAND J. MARCHAND, JR.
Supervisor

BETTY H. PENNY
Supervisor

GERALD SAUCIER
Supervisor

DONNIE A. TUMINELLO
Supervisor

PAT WALTON
Supervisor

PHYLLIS M. WILLIAMS
Supervisor

VOCATIONAL CURRICULUM DEVELOPMENT & RESEARCH CENTER

DAVID POSTON
Director

CURRICULUM DEVELOPMENT DEPARTMENT

MERVIN BIRDWELL
Curriculum Coordinator

W. H. (BUD) PARKISON
Curriculum Specialist

KENNETH W. POWERS
Curriculum Specialist

HUEY P. SONNIER
Curriculum Specialist

PEGGY CARR, R.N.
Curriculum Specialist

AGRICULTURE TECHNICAL COMMITTEES

FOREST TECHNOLOGY

Mr. Bobby Aldy
Boise Cascade
Southern Forest Resources
P. O. Box 1000
DeRidder, LA 70634

Mr. W. Dare Gueydan
Consulting Forester
Route 2, Box 75
Jonesboro, LA 71251

Mr. Joe Fowler
U. S. Forestry Service
P. O. Box 479
Homer, LA 71040-00479

Mr. Sammy Patrick, Instructor
Claiborne Vo-Tech School
3001 Minden Road
Homer, LA 71040

Mr. Donald J. Luenser, Instructor
Oakdale Vo-Tech School
P. O. Drawer EM
Oakdale, LA 71463

Mr. Huey P. Sonnier, Curriculum Specialist
Mr. Mervin Birdwell, Curriculum Coordinator
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Raymond Bell, Assistant Director
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

HORTICULTURE

Mr. Dan Davenport
Dan's Nursery
Rt. 1, Box 2694
Abbeville, LA 70510

Mr. Richard Odom
Country Pines Nursery
P. O. Box 99
Forest Hill, LA 71430

Mr. Bennie Crain, Instructor
Sullivan Vo-Tech Institute
1710 Sullivan Drive
Bogalusa, LA 70427

Mr. Paul Vitale, Instructor
Slidell Vo-Tech School
P. O. Box 827
Slidell, LA 70459-0827

Mr. Huey Sonnier, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Mervin Birdwell, Curriculum Coordinator
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Raymond Bell, Assistant Director
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

BUSINESS TECHNICAL COMMITTEES

DATA PROCESSING

Ms. Jo Augustine, Data Processing Manager
Entcor, Inc.
P. O. Box 3224
Lake Charles, LA 70602

Ms. Cathie Bishop, MIS Manager
Rubicon, Inc.
P. O. Box 517
Geismar, LA 70734

Mr. Scott Wehner, Director
Management Information and Services
City of Lake Charles
P. O. Box 1335
Lake Charles, LA 70602

Mr. Dalton McRight
Hawthorn, Waymouth, and Carroll, CPAs
8555 United Plaza Blvd., Suite 200
Baton Rouge, LA 70809

Mr. Errol Labot, Manager Systems Support
Information Services
General Health, Inc.
3600 Florida Blvd.
Baton Rouge, LA 70806

Ms. Laura Landry, Manager Systems and Programming
Information Services
General Health, Inc.
3600 Florida Blvd.
Baton Rouge, LA 70806

Mr. Robert Harrington, Instructor
Sowela Technical Institute
P. O. Box 16950
Lake Charles, LA 70616

Mr. Mervin Birdwell, Curriculum Coordinator
Vocational Curriculum Development and Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Ms. Phyllis Williams, Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

HOSPITALITY AND TOURISM

Ms. Martha Mikell, Sales Director
Rapides Parish Convention and Visitor Bureau
P. O. Box 8110
Alexandria, LA 71306

Ms. Karen Puckett, Executive Assistant
Louisiana Travel Promotion Association
P. O. Box 4003
Baton Rouge, LA 70821

Mr. Gerald Breaux, Executive Director
Lafayette Convention and Visitors Commission
P. O. Box 52066
Lafayette, LA 70505

Mr. Henry Tebbe, Personnel Director
Omni Royal Orleans Hotel
621 St. Louis St.
New Orleans, LA 70140

Mr. Rick Haygood, Director of Marketing
Baton Rouge Convention and Visitors Bureau
P. O. Box 4149
Baton Rouge, LA 70821

Mr. Robert A. Dudden, Deputy Assistant Secretary
Office of Tourism
La. Dept. of Culture, Recreation, & Tourism
P. O. Box 94291
Baton Rouge, LA 70804-9291

Ms. Dottie Belletto, Instructor
New Orleans Regional Vo-Tech Institute
980 Navarre Avenue
New Orleans, LA 70124

Mr. Mervin Birdwell, Curriculum Coordinator
Vocational Curriculum Development and Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Ms. Pat Walton, Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

OFFICE OCCUPATIONS

Mr. Ed Godwin, Personnel Director
City of Lake Charles
P. O. Box 900
Lake Charles, LA 70602

Ms. Jo Ann Brumfield
Corporate Training & Benefits Director
Goudchaux/Maison Blanche
P. O. Box 91102
Baton Rouge, LA 70821-9102

Ms. Donna Wilson, Executive Director
Southeastern University Development Foundation
P. O. Box 293 University Station
Hammond, LA 70401

Mr. Louis McKnight, CPA, Partner
Hawthorn, Waymouth & Carroll, CPAs
8555 United Plaza Blvd., Suite 200
Baton Rouge, LA 70809

Ms. Connie Buck, Supervisor
Business Education Section
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

Mr. Kevin Comboy, Personnel Director
Entcor, Inc.
P. O. Box 3224
Lake Charles, LA 70606

Mr. Jim Perrin
Employer Relations Supervisor
Rubicon, Inc.
P. O. Box 517
Geismar, LA 70734

Ms. Pat Webb Brian
Kelly Services
1938 Wooddale Blvd.
Baton Rouge, LA 70806

Mr. Mike McGrew, E.S.
Supervisor II
Louisiana Office of Employment Security
P. O. Box 271
Alexandria, LA 71309-0271

Ms. Jimmye Foster, Instructor
Hammond Area Vocational School
P. O. Box 489
Hammond, LA 70404

Ms. Sue Payne, Instructor
Northeast Louisiana Vocational School
1710 Warren St.
Winnsboro, LA 71295

Mr. Mervin Birdwell, Curriculum Coordinator
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Ms. Phyllis Williams, Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

SALESMANSHIP (MARKETING)

Mr. Dave Mortensen, Senior Merchandising Manager
J. C. Penney Cortana Mall
14161 Florida Blvd.
Baton Rouge, LA 70819

Mr. Paul Duncan, Merchandising Manager
J. C. Penney Cortana Mall
14161 Florida Blvd.
Baton Rouge, LA 70819

Ms. Linnie Keller, Director of Recruiting
Maison Blanche/Goudchaux
P. O. Box 91102
Baton Rouge, LA 70821-9102

Ms. Sandra Wolf, Personnel Director
D. H. Holmes
P. O. Box 871
Baton Rouge, LA 70821

Ms. Linda Wallace, Human Resources Manager
Eckerd's Drugs
825 Pride Blvd.
Hammond, LA 70404

Mr. David Settle, Area Operations Manager
Eckerd's Drugs
825 Pride Blvd.
Hammond, LA 70404

Mr. Randy Smith, Owner
True Value Hardware
438 Columbia St.
Bogalusa, LA 70427

Ms. Genie McAllister
11653 Fairoak
Baton Rouge, LA 70815

Ms. Marilyn Wright, Instructor
Sullivan Vo-Tech Institite
1710 Sullivan Drive
Bogalusa, LA 70427

Mr. Mervin Birdwell, Curriculum Coordinator
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Ms. Phyllis Williams, Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

COMMUNICATIONS TECHNICAL COMMITTEES

TELEVISION PRODUCTION

Mr. Edward Landry
Louisiana Public Broadcasting Co.
7860 Anselmo Lane
Baton Rouge, LA 70810

Mr. Carl Fry
Louisiana Public Broadcasting Co.
7860 Anselmo Lane
Baton Rouge, LA 70810

Mr. Pete Battaglia, Instructor
Delta-Ouachita Vo-Tech Institute
West Ouachita Industrial Park
609 Vocational Parkway
West Monroe, LA 71291

Mr. Huey P. Sonnier, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Ms. Pat Walton, Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

CONSUMER, PERSONAL, AND MISCELLANEOUS SERVICES TECHNICAL COMMITTEES

BARBERING

Mr. James A. Adams, Jr., President
Louisiana State Board of Barber Examiners
Owner, New Generation Hair Design
609 Superior Avenue
Bogalusa, LA 70427

Mr. Eric Harrington, Owner
Curl Conspiracy
2621 Choctaw Drive
Baton Rouge, LA 70805

Mr. John A. Lofton, Sr., Owner
Lofton's Hair Care Center
1022 Swan Avenue
Baton Rouge, LA 70807

Mr. Mitch Achord, Owner
Changes in Hair
6637 Sullivan Road
Greenwell Springs, LA 70739

Mr. Salvador Coronado, Instructor
Baton Rouge Vo-Tech Institute
3250 North Acadian Thruway
Baton Rouge, LA 70805

Mr. Mervin Birdwell, Curriculum Coordinator
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Ms. Peggy Carr, R.N., Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Ms. Betty Penny, Supervisor
Health Occupations Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

COSMETOLOGY

Mrs. Joel C. Mumphrey, President
Louisiana State Board of Cosmetology
2913 Acorn Drive
Violet, Louisiana 70092

Ms. Beverly McNair, Cosmetologist
2695 Bogan Walk
Baton Rouge, LA 70802

Mrs. Asilee Mathews, Cosmetologist
1480 Bellonia Drive
Baton Rouge, LA 70810

Mrs. Gloria Moore, Instructor
James M. Frazier Vo-Tech School
555 Julia St.
Baton Rouge, LA 70802

Ms. Peggy Carr, R.N., Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Mervin Birdwell, Curriculum Coordinator
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Ms. Betty Penny, Supervisor
Health Occupations Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

ENGINEERING TECHNICAL COMMITTEES

BIOMEDICAL EQUIPMENT TECHNOLOGY

Mr. Henry Tindall, Director of Plant Operations
Our Lady of Lourdes Hospital
611 St. Landry
P. O. Box 4027C
Lafayette, LA 70506

Mr. Thomas Webre, Clinical Engineering Supervisor
Our Lady of the Lake Medical Center
Plant Management Department
5000 Hennessy Boulevard
Baton Rouge, LA 70809

Mr. Carroll James Broussard, Maintenance Superintendent
Walter Olin Moss Regional Hospital
1000 Walters Street
Lake Charles, LA 70605

Mr. Jim Mainer, Biomedical Engineer
St. Patrick Hospital of Lake Charles
524 South Ryan Street
Lake Charles, LA 70601

Mr. James A. Roussell
Washington-St. Tammany Charity Hospital
400 Memphis Street
Bogalusa, LA 70427

Mr. Wayne Bush, Instructor
Sullivan Vo-Tech Institute
1710 Sullivan Drive
Bogalusa, LA 70427

Mr. Jim LeCompte, Dir. of Biomedical Engineering
Baton Rouge General Hospital
3600 Florida Boulevard
Baton Rouge, LA 70806

Mr. Irby J. Dupuis
Lafayette General Medical Center
1214 Coolidge Boulevard
P. O. Box 52009 Oil Center Station
Lafayette, LA 70505

Mr. Huey P. Sonnier, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Cleveland Marchand, Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

CIVIL ENGINEERING TECHNOLOGY

Mr. Barry L. Moore, II, Civil Engineer
Barry L. Moore and Associates
P. O. Box 52838
Baton Rouge, LA 70805

Mr. Herbert J. Juneau, Jr., Area Engineer
U. S. Army Corps of Engineers
103 East Cypress St.
Lafayette, LA 70501

Mr. Kenneth Fontenot, Land Surveyor
John Chance and Associates
P. O. Box 52029
Lafayette, LA 70505

Mr. C. L. Jack Stelly, President
C. L. Jack Stelly and Associates
P. O. Box 53353
Lafayette, LA 70505

Mr. Willis Grice
Assistant Location and Survey Engineer
Dept. of Transportation & Development
P. O. Box 44245 Capitol Station
Baton Rouge, LA 70804

Mr. Michael J. Stelly, Instructor
T. H. Harris Vo-Tech School
P. O. Box 713
Opelousas, LA 70570

Mr. W. H. Parkison, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. C. R. Bell, Jr., Assistant Director
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

ARCHITECTURAL DRAFTING

Mr. Greg Smotherman, Architect
P. O. Box 4092
Alexandria, LA 71301

Mr. James Platt, A.I.A.
Architecture Six, Inc.
316 Iris
Lake Charles, LA 70601

Mr. Mike Landry, A.I.B.D., Owner
Mike Landry Planning and Design
310½ West Vermilion St.
Lafayette, LA 70501

Mr. Donald M. Gore, A.I.B.D., Partner
Architectural Design Associates
P. O. Box 3073
Hammond, LA 70404

Mr. Dan Hicks, Instructor
Alexandria Vo-Tech Institute
4311 South MacArthur Drive
Alexandria, LA 71302-3137

Mr. W. H. Parkison, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. C. R. Bell, Jr., Assistant Director
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

BASIC DRAFTING

Mr. Louis J. Chapoton
CAD/CAM Applications Engineer
Martin Marietta Aerospace
Department 3453
P. O. Box 29304
New Orleans, LA 70189

Mr. Larry Miller
Supervisor, Computer Graphics
McDermott, Inc.
1010 Common St.
New Orleans, LA 70160

Mr. Greg Smotherman, Architect
P. O. Box 4092
Alexandria, LA 71301

Dr. James Owens, Assistant Professor
Department of Industrial Technology
Southeastern Louisiana University
P. O. Box 847
Hammond, LA 70402

Mr. Daniel J. Peltier, Instructor
South Louisiana Vo-Tech Institute
201 St. Charles St.
Houma, LA 70361

Mr. Colin Fake, Instructor
Sowela Technical Institute
3820 Legion St.
Lake Charles, LA 70616

Mr. Bud Parkison, Curriculum Specialist
Vocational Curriculum Development and Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. C. R. Bell, Jr., Assistant Director
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

CIVIL/MAP DRAFTING

Ms. Bonnie Cooper
N.R.W. Associates, Inc.
1905 Highway 509
Mandeville, LA 70448

Mr. Jessie Cedotal
Gulf South Engineers, Inc.
1700 Grand Caillou
Houma, LA 70363

Ms. Margaret Eller
Sograph Design
P. O. Box 80598
Baton Rouge, LA 70898

Mr. Edward Burt, Instructor
Sullivan Vo-Tech Institute
1710 Sullivan Drive
Bogalusa, LA 70427

Mr. Bud Parkison, Curriculum Specialist
Vocational Curriculum Development and Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. C. R. Bell, Jr., Assistant Director
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

ELECTRICAL SYSTEMS DRAFTING

Mr. Edgar Jenkins, President
Trident Communications, Inc.
P. O. Box 606
Belle Chasse, LA 70037

Mr. Stephen A. Troxler, Staff Engineer
Electrical Engineering Department
Waldemar F. Nelson and Co., Inc.
1200 St. Charles Avenue
New Orleans, LA 70130

Mr. Henry Lee, Instructor
Young Memorial Vo-Tech School
900 Young Road
Morgan City, LA 70381

Mr. Bud Parkison, Curriculum Specialist
Vocational Curriculum Development and Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. C. R. Bell, Jr., Assistant Director
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

INTRODUCTION TO DRAFTING DISCIPLINES AND ADVANCED CAD

Mr. Marvin Veuleman, Jr., Structural Engineer
H.N.T.B.
100 Saint James St. Suite J 200
Baton Rouge, LA 70802

Mr. Gary Patrick, Owner
Patrick Drafting Services
1200 Market St
Shreveport, LA 71107

Mr. W. J. Lechtenberg, Jr., Partner
D L & L Computer Drafting Services
300 E. McNeese
P. O. Box 6483
Lake Charles, LA 70606

Mr. Prescott Follett, President
Allied Engineering Corp.
822 Baronne St.
New Orleans, LA 70113

Ms. Bobbie Ducote, Drafting Supervisor
Camco/Autocon
218 Thruway Park Road
Broussard, LA 70518

Mr. James Platt, A.I.A.
Architecture Six, Inc.
316 Iris
Lake Charles, LA 70601

Mr. Colin Fake, Instructor
Sowela Technical Institute
3820 Legion St.
Lake Charles, LA 70616

Mr. Daniel J. Peltier, Instructor
South Louisiana Vo-Tech Institute
201 St. Charles St.
Houma, LA 70361

Mr. Jerry Baxter, Instructor
Sabine Valley Vo-Tech School
Highway 171 South
Many, LA 71449

Mr. Albert Bacque', Instructor
Lafayette Regional Vo-Tech Institute
P. O. Box 4909
Lafayette, LA 70502-4909

Mr. Bud Parkison, Curriculum Specialist
Vocational Curriculum Development and Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. C. R. Bell, Jr., Assistant Director
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

MANUFACTURING DRAFTING

Mr. Terry Cassel, Drafting Supervisor
Tri-State Oil Tool Industries, Inc.
2570 East Texas
Bossier City, LA 71112

Mr. Robert Blanche, Office Manager
Bovay Engineers, Inc.
P. O. Box 95301
Baton Rouge, LA 70895

Mr. Bren Kramer, Vice-President
Levy-Kramer and Associates, Inc.
422 Colonial Drive
Baton Rouge, LA 70806

Mr. Michael W. Doucet, Instructor
Southwest Louisiana Vo-Tech School
1933 West Hutchinson Ave.
Crowley, LA 70527-0820

Mr. Bud Parkison, Curriculum Specialist
Vocational Curriculum Development and Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. C. R. Bell, Jr., Assistant Director
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

MARINE DRAFTING

Mr. Mitch Hoffpauir, Drafting Supervisor
McDermott Shipyards
P. O. Box 188
Morgan City, LA 70381

Mr. Dip Ganguly, Manager
Computer Applications
Bollinger Shipyard
P. O. Box 250
Lockport, LA 70374

Mr. Salvadore Guarino, President
Guarino and Cox, Inc.
5670 Hayne Blvd., Suite B
New Orleans, LA 70126

Mr. Colin Fake, Instructor
Sowela Technical Institute
3820 Legion Street
Lake Charles, LA 70616

Mr. Bud Parkison, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. C. R. Bell, Jr., Assistant Director
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

PIPING DRAFTING

Mr. Larry Miller
Supervisor, Computer Graphics
McDermott, Inc.
1010 Common Street
New Orleans, LA 70160

Mr. Bob Ashe, Manager
Inplant Services
Process Services, Inc.
P. O. Box 45054
Baton Rouge, LA 70895

Ms. Bobbie Ducote, Drafting Supervisor
Camco/Autocon
218 Thruway Park Road
Broussard, LA 70518

Mr. Roy Eunice, Instructor
Baton Rouge Vo-Tech Institute
3250 N. Acadian Thruway
Baton Rouge, LA 70805

Mr. Bud Parkison, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. C. R. Bell, Jr., Assistant Director
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

STRUCTURAL DRAFTING

Mr. Larry Miller
Supervisor, Computer Graphics
McDermott, Inc.
1010 Common Street
New Orleans, LA 70160

Mr. Marvin Veuleman, Jr., Structural Engineer
H.N.T.B.
100 Saint James Street, Suite J 200
Baton Rouge, LA 70802

Mr. John Brynsvold, Manager
Structural and Architectural Design
Ford, Bacon and Davis
P. O. Box 1894
Monroe, LA 71210

Mr. Rene' Manco, Owner
Manco Enterprises, Inc.
2715 Mackey Place, Suite 201
Shreveport, LA 71118

Mr. Robert Kelly, Instructor
Jefferson Parish West Bank Vo-Tech School
475 Manhattan Boulevard
Harvey, LA 70058

Mr. Bud Parkison, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. C. R. Bell, Jr., Assistant Director
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

ELECTROMECHANICAL TECHNOLOGY

Mr. Brad Hamsel, Field Engineer
Delta Process Equipment, Inc.
P. O. Box 969
9929 Florida Blvd.
Denham Springs, LA 70739

Mr. Maurice Curtis, Jr., Instructor
Baton Rouge Vo-Tech Institute
3250 North Acadian Thruway
Baton Rouge, LA 70805

Mr. Huey P. Sonnier, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Bud Parkison, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Cleveland Marchand, Jr., Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

MOTOR VESSEL ENGINEER

Mr. Garland Poarch
Zapata Gulf Marine Company
1268 Destrahan Avenue
P. O. Box 802
Harvey, LA 70058

Mr. Frank Dick, Personnel Representative
Nicor Marine, Inc.
Highway 182 Bayou Vista
P. O. Box 2291
Bayou Vista, LA 70380

Mr. Gerald Hoffman, Vice-President
Offshore Express
438 Menard Road
Houma, LA 70361

Mr. Walter Wise, Personnel Manager
Dixie Carriers, Inc.
2266 Peters Road
P. O. Box 900
Harvey, LA 70058

Mr. Yockey Bernard
c/o Mr. Tom Finn, Director of Personnel
J. Ray McDermott, Inc.
Highway 90 Amelia
P. O. Box 188
Morgan City, LA 70380

Commander Carl E. Wolcott
Marine Inspection Office
600 South Maestri Place
New Orleans, LA 70130

Mr. Floyd J. Verrett, Operations Manager
Tidex, Inc.
Foot of First Street
P. O. Box 2527
Morgan City, LA 70381

Mr. V. J. Gianelloni
Louisiana Marine & Petroleum Institute'
Dickson Road
Box 5033
Houma, LA 70361

Mr. Gerald Bergeron, Instructor
Terrebonne Parish Vo-Tech School
c/o Houma Air Base
No. 1 Sayre Road
Houma, LA 70360

Mr. Huey P. Sonnier, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. C. R. Bell, Jr., Assistant Director
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

NONDESTRUCTIVE TESTING

Mr. Hank Witter, President
Inspection Specialist, Inc.
5201 Tara Vella Road
Marrero, LA 70073

Mr. Ronnie Deshotel, Instructor
T. H. Harris Vo-Tech School
P. O. Box 713
337 East South Street
Opelousas, LA 70570

Mr. Kenneth Powers, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Bud Parkison, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Cleveland Marchand, Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Dept. of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

PROCESS TECHNICIAN

Mr. Otis Crawford
Shell Chemical
12516 Park Trail
Baton Rouge, LA 70816

Mr. Joe Pizzuto
BASF Wyandotte
P. O. Box 457
Geismar, LA 70734

Mr. Richard Marino
Marathon Oil
P. O. Box AC
Garyville, LA 70051

Mr. Rene Elfer, Instructor
River Parishes Vo-Tech School
P. O. Drawer AQ
Reserve, LA 70084

Mr. Huey P. Sonnier, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Bud Parkison, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Cleveland Marchand, Jr., Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

HEALTH OCCUPATIONS TECHNICAL COMMITTEES

EMERGENCY MEDICAL TECHNICIAN (EMT) - PARAMEDIC

Mr. Ray Bias, Education Director
Acadian Ambulance Service, Inc.
P. O. Box 98000, O.C.S.
Lafayette, LA 70509-8000

Mr. Albert Heck, Director
Bureau of Emergency Medical Services
DHHR, Office of Hospitals
200 Lafayette Street
Baton Rouge, LA 70804

Ms. Nancy Bourgeois, R.N.
Training Coordinator
Bureau of Emergency Medical Services
DHHR, Office of Hospitals
200 Lafayette Street
Baton Rouge, LA 70804

Ms. Laura Gore, R.N. Instructor
Elaine P. Nunez Vo-Tech School
3700 LaFontaine Street
Chalmette, LA 70043

Ms. Peggy Carr, R.N., Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. David Poston, Director
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Ms. Betty Penny, Supervisor
Health Occupations Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

MEDICAL LABORATORY TECHNICIAN

Ms. Geraldine Hurt, M.T., Laboratory Supervisor
Lallie Kemp Hospital
P. O. Box 70
Independence, LA 70443

Ms. Claudia Landry, M.T.
Acadiana Medical Laboratory
217 Rue France
Lafayette, LA 70508

Ms. Anita Broussard, M.T., Instructor
Baton Rouge Vo-Tech Institute
5836 Trenton Avenue
Baton Rouge, LA 70808

Ms. Peggy Carr, R.N., Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. David Poston, Director
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Ms. Sidney Landry, M.L.T.-C.
Baton Rouge General Hospital
9771 Jefferson Hwy. No. 65
Baton Rouge, LA 70809

Ms. Desiree Perry, M.T., Instructor
Lafayette Regional Vo-Tech Institute
1101 Bertrand Drive
Lafayette, LA 70502

Ms. Betty Penny, Supervisor
Health Occupations Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

NURSE ASSISTANT

Ms. Diane Foster, Nurse Assistant
Baton Rouge General Hospital
704 North 46th Street
Baton Rouge, LA 70802

Ms. Mildred Tolliver, Nurse Assistant
Baton Rouge General Hospital
4005 North Barrow Drive
Baton Rouge, LA 70802

Ms. Bobby White, Nurse Assistant
Baton Rouge General Hospital
10097 Avenue L
Baton Rouge, LA 70807

Ms. Myrtle Dear, Psychiatric Aide Supervisor
East Louisiana State Hospital
P. O. Box 457
Jackson, LA 70748

Ms. Julie Shiver, R.N.
Supervisor Medical Personnel Pool
Home Health Services
4744 Jamestown
Baton Rouge, LA 70808

Ms. Frances Robichaux, Instructor
Thibodaux Area Vo-Tech School
P. O. Box 1831
Thibodaux, LA 70302-1831

Ms. Peggy Carr, R.N., Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Ms. Betty Penny, Supervisor
Health Occupations Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

PRACTICAL NURSING

Ms. Terry Demarcay, R.N., Executive Director
Ms. Claire Glaviano, R.N., Assistant Executive Director
Louisiana State Board of Practical Nurse Examiners
1440 Canal Street, Suite 2010
New Orleans, LA 70112

Ms. Margaret Langford, R.N., Patient Representative
Patient Concerns Department
Baton Rouge General Hospital
P. O. Box 2511
Baton Rouge, LA 70821

Ms. Quinlyn Nichols, LPN
Baton Rouge General Hospital
47 Holiday Park
Baton Rouge, LA 70816

Ms. Loretta Parkison, Instructor
Natchitoches Central Area Vo-Tech School
P. O. Box 657
Natchitoches, LA 71458-0657

Ms. Peggy Carr, R.N., Curriculum Specialist
Mr. David Poston, Director
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Ms. Betty Penny, Supervisor
Health Occupations Education
Office of Vocational Education
Louisiana State Dept. of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

RESPIRATORY THERAPY TECHNICIAN

Mr. Glenn Broussard, R.R.T.
Director, Respiratory Therapy
University Medical Center
2390 West Congress Street
Lafayette, LA 70502

Ms. Rebecca Vidrine, R.R.T., Program Director
West Jefferson Medical Center and
Jefferson Parish West Bank Vo-Tech School
475 Manhattan Blvd.
Harvey, LA 70058

Ms. Peggy Carr, R.N., Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. David Poston, Director
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Ms. Betty Penny, Supervisor
Health Occupations Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

SURGICAL TECHNOLOGY

Ms. Pat West, C.S.T.
Orthopedic Specialty
1502 Railroad Avenue
Monroe, LA 71202

Ms. JoAnn Curtis, R.N.
Operating Room Director
North Monroe Community Hospital
3421 Medical Park Avenue
Monroe, LA 71201

Mr. Jim Herbert, R.N.
Assistant Administrator
Opelousas General Hospital
520 Prudhomme Lane
Opelousas, LA 70570

Ms. Becky Ham, Instructor
Delta-Ouachita Vo-Tech Institute
609 Vocational Parkway
West Monroe, LA 71291

Ms. Peggy Carr, R.N., Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. David Poston, Director
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Ms. Betty Penny, Supervisor
Health Occupations Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

Ms. Patricia Hebert, Instructor
T. H. Harris Vo-Tech School
102 Westwood Dr., Apt. 343
Lafayette, LA 70506

WARD CLERK

Ms. Ida Clark, Station Manager
Baton Rouge General Hospital
1736 Mary Lou Drive
Baton Rouge, LA 70810

Ms. Lois Sanders, Station Manager
Baton Rouge General Hospital
5166 Packard St.
Baton Rouge, LA 70811

Ms. Frances Robichaux, Instructor
Thibodaux Area Vo-Tech School
P. O. Box 1831
Thibodaux, LA 70302-1831

Ms. Peggy Carr, R.N., Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Ms. Betty Penny, Supervisor
Health Occupations Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

HOME ECONOMICS TECHNICAL COMMITTEES

CHILD CARE

Ms. Roselyne Nobles, Director
Our Lady of Lourdes Hospital
Child Care Center
611 St. Landry Street
Lafayette, LA 70502

Ms. Janet Lantier, Director
Children's Community School
211 J. B. Road
Lafayette, LA 70506

Ms. Gloria Porter
Day Care Training Program Manager
St. Mark's Community Center
1130 North Rampart St.
New Orleans, LA 70116

Ms. Carolyn Hoyt, Program Coordinator
The Parenting Center of Family Counseling
4727 Revere Avenue
Baton Rouge, LA 70808

Ms. Dawn Miner
Director Child Care
Kinder Care
7935 Director Drive
Baton Rouge, LA 70817

Ms. Barbara Thomas, Instructor
New Orleans Regional Vo-Tech Institute
980 Navarre Avenue
New Orleans, LA 70124

Ms. Janie Bizette, Instructor
Lafayette Regional Vo-Tech
1101 Bertrand Drive
Lafayette, LA 70502-4909

Ms. Carol Aghayan, Instructor
Baton Rouge Vo-Tech Institute
3250 N. Acadian Thruway
Baton Rouge, LA 70805

Ms. Peggy Carr, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Ms. Betty Penny, Supervisor
Health Occupations Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

COMMERCIAL SEWING

Mrs. Evelyn Rizzuto, Manager
Toni's Draperies & Interiors
12330 Florida Blvd., Suite 10
Baton Rouge, LA 70815

Mr. Kenneth Pettus
Gary Fries Designs, Inc.
P. O. Box 40686
Baton Rouge, LA 70835-0686

Ms. Aline Trowbridge, Instructor
Shreveport-Bossier Vo-Tech Institute
2010 North Market Street
Shreveport, LA 71137

Ms. Charlotte T. Lefebvre, Instructor
Memorial Area Vocational School
508 Louisiana Avenue
Port Allen, LA 70767

Ms. Peggy Carr, Curriculum Specialist
Vocational Curriculum Development and Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Kenneth Powers, Curriculum Specialist
Vocational Curriculum Development and Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Ms. Phyllis Williams, Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

CULINARY OCCUPATIONS

Chef Leopold Longoria
Baton Rouge City Club
11417 Talton Avenue
Baton Rouge, LA 70816

Chef Louis Jesowshek
Our Lady of the Lake Hospital
5000 Hennessy Blvd.
Baton Rouge, LA 70809

Mr. Ken Watson
District Sales Manager
Conco Food Service
1021 St. Patrick
Lafayette, LA 70506

Mr. Bill Smith
President, Greater Baton Rouge Chapter of Louisiana Restaurant Association
General Manager, Baton Rouge Hilton
5500 Hilton Avenue
Baton Rouge, LA 70808

Ms. Carmen Riley, Instructor
Elaine P. Nunez Vo-Tech School
3700 LaFontaine St.
Chalmette, LA 70043

Ms. Anita Sawyer, Instructor
Baton Rouge Vo-Tech Institute
3250 N. Acadian Thruway
Baton Rouge, LA 70805

Ms. Peggy Carr, Curriculum Specialist
Vocational Curriculum Development and Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Ms. Betty Penny, Supervisor
Health Occupations Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

DIETARY MANAGER

Ms. Jane Conley, R.D.
DHHR Division of Licensing & Certification
P. O. Box 3767
Baton Rouge, LA 70821

Ms. Juanita Williams, R.D.
Administrative Dietician
Earl K. Long Hospital
5825 Airline Hwy.
Baton Rouge, LA 70805

Ms. Marcy Drum, R.D.
Conco Food Service
918 Edwards Avenue
Harahan, LA 70123

Ms. Michelle Dileo, R.D., Instructor
Ms. Mary Landry, R.D., Instructor
Jefferson Parish Vo-Tech School
5200 Blair Drive
Metairie, LA 70001

Ms. Anita Sawyer, Instructor
Baton Rouge Vo-Tech Institute
3250 N. Acadian Thruway
Baton Rouge, LA 70805

Ms. Peggy Carr, Curriculum Specialist
Vocational Curriculum Development and Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Ms. Betty Penny, Supervisor
Health Occupations Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

HOMEMAKER'S AIDE

Ms. Bennifer Tennel, Administrative Assistant
East Baton Rouge Council on Aging
2905 Fairfields Avenue
Baton Rouge, LA 70802

Mr. Keith Horcasitas, Social Service Director
Mr. Charles Smith, Field Supervisor
New Orleans Council on Aging
P. O. Box 19067
New Orleans, LA 70179-0067

Mr. Michael Edwards, Services Director
Ms. Janet Finlaw, Case Management Supervisor
Jefferson Council on Aging
P. O. Box 6878
Metairie, LA 70009

Ms. Marion Bonnie, Instructor
Evangeline Vocational-Technical School
P. O. Box 68
St. Martinville, LA 70582

Ms. Peggy Carr, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Ms. Phyllis Williams, Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

TRADE AND INDUSTRIAL TECHNICAL COMMITTEES

AIR CONDITIONING/REFRIGERATION

Mr. Joe King
Southwestern Electric Power Co.
(SWEPCO)
428 Travis Street
Shreveport, LA 71156-1106

Mr. Willie M. Montgomery
Montgomery's Service
603 Murray St.
Lake Charles, LA 70601

Mr. Don Owings
Jim Brown Refrigeration
629 Farrington Drive
P. O. Box 1430
Marrero, LA 70073-1430

Mr. Charles E. Maher
Hotel Meridien—New Orleans
614 Canal St.
New Orleans, LA 70130

Mr. Robert Logue, Instructor
Shreveport-Bossier Vo-Tech Institute
2010 North Market St.
P. O. Box 78527
Shreveport, LA 71137-8527

Mr. Nolan D. Simon, Instructor
Baton Rouge Vo-Tech Institute
3250 North Acadian Thruway
Baton Rouge, LA 70805

Mr. Huey F. Sonnier, Curriculum Specialist
Vocational Curriculum Development
& Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Bud Parkison, Curriculum Specialist
Vocational Curriculum Development
& Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Gerald Saucier, Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

APPLIANCE REPAIR

Mr. Burt Sabathier
Whirlpool Corporation
Consumer Affairs Division
5800 Jefferson Highway
Harahan, LA 70123

Mr. Jess Fenton
6910 West Canal St.
Shreveport, LA 71108

Mr. Howard Cooper, Instructor
Natchitoches Central Area Vo-Tech School
220 Highway 3110 South Bypass
P. O. Box 657
Natchitoches, LA 71457-0657

Mr. Huey P. Sonnier
Curriculum Specialist
Vocational Curriculum Development
& Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Bud Parkison
Curriculum Specialist
Vocational Curriculum Development
& Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Gerald Saucier, Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

AUTO BODY REPAIR

Ms. Sandra Hutchens, Body Shop Manager
Woodfin-Smith Pontiac
300 Wooddale Blvd.
Baton Rouge, LA 70806

Mr. Kenneth Hayward, Auto Body Technician
Coleman Oldsmobile, Inc.
9150 Airline Highway
Baton Rouge, LA 70815

Mr. Duane Kimball, Instructor
Shreveport-Bossier Vo-Tech Institute
P. O. Box 78527
Shreveport, LA 71137

Mr. Bud Parkison, Curriculum Specialist
Vocational Curriculum Development
& Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Donnie Tuminello, Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
1525 Fairfield Avenue
Shreveport, LA 71104

AUTOMOTIVE TECHNICIAN

Mr. Randy Owens
Parts & Service Director
Woodfin-Smith Pontiac, Inc.
300 Wooddale Blvd.
Baton Rouge, LA 70806

Mr. Donald Allen
Allen's Service Center
P. O. Box 6613
Shreveport, LA 71136

Mr. Mike Harris, Service Director
University Ford
7787 Florida Blvd.
Baton Rouge, LA 70806

Mr. Roy S. Osborne, Owner
Broadmoor Garage
505 E. Kings Highway
Shreveport, LA 71105

Mr. R. L. Stewart, Owner
Car Medic, Inc.
9404 S. Choctaw Dr.
Baton Rouge, LA 70815

Mr. Rudolph D. Deason, Instructor
Shreveport-Bossier Vo-Tech Institute
P. O. Box 78527
Shreveport, LA 71137-8527

Mr. Kenneth W. Powers, Curriculum Specialist
Vocational Curriculum Development &
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Donnie Tuminello, Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
1525 Fairfield Avenue, Room 653
Shreveport, LA 71104

AVIATION MAINTENANCE TECHNOLOGY

Mr. Larry Kidwell
Chief of Aircraft Maintenance
Department of Transportation and Development
8900 C Street
Baton Rouge, LA 70807

Mr. Earl McCarthy, Federal Aviation Agency
Principal Aviation Safety Inspector (Airworthiness)
Southwest Flight Standard District Office - 62
9191 Plank Road
Baton Rouge, LA 70811

Mr. Glenn R. Carter, Aviation Department Head
Sowela Technical Institute
P. O. Box 16950
Lake Charles, LA 70616

Mr. Kenneth W. Powers, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Donnie Tuminello, Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
1525 Fairfield Avenue
Shreveport, LA 71104

BAND AND CIRCULAR SAW FILING

Mr. Charles McInnis
McInnis Saw Services
P. O. Box 787
Hodge, LA 71247

Mr. Don Till, Saw Filing Supervisor
Cavenham Forest Industries
P. O. Box 280
Holden, LA 70744

Mr. Johnny Tippy, Instructor
Sabine Valley Vo-Tech School
Highway 171 South
Many, LA 71449

Mr. Bud Parkison, Curriculum Specialist
Vocational Curriculum Development and Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. David Poston, Director
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Gerald Saucier, Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

CARPENTRY

Mr. Paul Shows, Contractor
P. O. Box 272
Goldonna, LA 71031

Mr. Jack Mills, District Manager
Associated General Contractors
150 Industrial Parkway
Lafayette, LA 70508

Mr. Clyde Cooper, Instructor
Sullivan Vo-Tech Institute
1710 Sullivan Drive
Bogalusa, LA 70427

Mr. Bud Parkison, Curriculum Specialist
Vocational Curriculum Development and Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Mervin Birdwell, Curriculum Coordinator
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Gerald Saucier, Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

COMMERCIAL ART

Mr. Mark H. Hebert, Owner
Hebert Sign Company
Rt. 14, Box 1800
Lake Charles, LA 70605

Mr. Mark Giese, Plant Manager
Crescent Decal
1407 Carroll St.
Kenner, LA 70062

Mr. Dave Ivey, Owner
Dave Ivey Graphics, Inc.
1600 Fairfield Ave.
Shreveport, LA 71101

Ms. Betsy Griffin, Commercial Artist
Morning Advocate - State Times
P. O. Box 588
Baton Rouge, LA 70821

Mrs. Geraldine Hebert, Instructor
Sowela Technical Institute
P. O. Box 16950
Lake Charles, LA 70616

Mr. Bryan Flach, Instructor
Jefferson Parish Vo-Tech School
5200 Blair Drive
Metairie, LA 70001

Mr. Kerry M. Curtin
Education Specialist
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

Mr. Mervin Birdwell, Curriculum Coordinator
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Ms. Pat Walton, Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

COMMUNICATIONS ELECTRONICS

Mr. Al Bennett
Office of Emergency Preparedness
Land and Natural Resources Building, Basement Rm. 17
625 North Fourth Street
P. O. Box 66536
Baton Rouge, LA 70896-6536

Mr. Jim Miller
Motorola, Inc.
319 Mecca Drive
Lafayette, LA

Mr. Huey Segura
Marathon Oil Company
1819 Pinhook Road
Lafayette, LA 70508

Mr. Frank Falcon, Instructor
Teche Area Vo-Tech School
Acadiana Regional Airbase
P. O. Box 1057
New Iberia, LA 70561-1057

Mr. Harry Latiolais, Department Head
Lafayette Regional Vo-Tech Institute
1101 Bertrand Drive
P. O. Box 4909
Lafayette, LA 70502-4909

Mr. Huey P. Sonnier, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Cleveland Marchand, Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

COMPUTER ELECTRONICS

Mr. Jerry O'Neal Bonner
Computer Service of Shreveport
875 West Gate Lane
Bossier City, LA 71112

Mr. William R. Wheeless
United Information Systems (UNISYS)
8550 United Plaza B, Suite 600
Baton Rouge, LA 70809

Mr. Charles Black, Instructor
Shreveport-Bossier Vo-Tech Institute
2010 North Market Street
P. O. Box 78527
Shreveport, LA 71137-8527

Mr. Barney D. Lejeune, Instructor
Southwest Louisiana Vo-Tech School
P. O. Box 820
Crowley, LA 70527-0820

Mr. Huey P. Sonnier, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Mervin Birdwell, Curriculum Coordinator
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Cleveland Marchand, Jr., Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

CONSUMER ELECTRONICS TECHNICIAN

Mr. Pierre Wilson Trahan
Lafayette Radio Equipment
307 Bertrand Drive
Lafayette, LA 70506

Mr. Dallas Benoit
Benoit Television Sales & Service
1402 North University Ave.
Lafayette, LA 70506

Mr. Thomas Kennedy
RCA Service Co.
9633 Hillsboro
Shreveport, LA 71118

Mr. Charles P. Langston
Montgomery Ward
395 High Meadows Boulevard
Lafayette, LA 70507

Mr. Stanley Brohn, Secretary
Louisiana State Radio & Television Technicians Board
1955 Dallas Drive
Baton Rouge, LA 70806

Mr. Richard Labbe, Instructor
Lafayette Regional Vo-Tech Institute
1101 Bertrand Drive
P. O. Box 4909
Lafayette, LA 70502-4909

Mr. Walter Ray Gunter, Instructor
Shreveport-Bossier Vo-Tech Institute
2010 North Market St.
P. O. Box 78527
Shreveport LA 71137-8527

Mr. Huey P. Sonnier, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Cleveland Marchand, Jr., Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

DIESEL MECHANICS

Mr. Marlin Troxell, Technical Communicator
Holt Company
100 Airline Highway
Reserve, LA 70084

Mr. Wayne Hudspeth, Truck Service Manager
George Engine Co.
P. O. Box 8
Harvey, LA 70059

Mr. Reece Powell, Instructor
Port Side Vocational School
3233 Rosedale Road
Port Allen, LA 70767

Mr. Kenneth W. Powers, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Donnie Tuminello, Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
1525 Fairfield Avenue, Room 653
Shreveport, LA 71104

ELECTRICIAN

Mr. Ambrose Constantine
Acadian Metro-Code
707 West University
Lafayette, LA 70506

Mr. Frank Prattini
Prattini Electric Co., Inc.
812 Little Farms Avenue
Metairie, LA 70003

Mrs. Carol Newell
Davis International
7353 Town South
Baton Rouge, LA 70808

Mr. Leonard Taylor
Taylor and Sons Electric Co., Inc.
3046 Washington Avenue
Baton Rouge, LA 70802

Mr. James Moran, Instructor
Lafayette Regional Vo-Tech Institute
P. O. Box 4909
Lafayette, LA 70502-4909

Mr. Richard Sanders, Instructor
Baton Rouge Vo-Tech Institute
3250 North Acadian Thruway
Baton Rouge, LA 70805

Mr. Huey P. Sonnier, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Kenneth W. Powers, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Cleveland Marchand, Jr., Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

ELECTRONICS (FIRST YEAR)

Mr. Winston L. Fontenot
Communications Foreman
Gulf States Utilities
P. O. Box 2431
Baton Rouge, LA 70821

Mr. Roland J. Ducote
Communications Supervisor
Gulf States Utilities
P. O. Box 2431
Baton Rouge, LA 70821

Mr. Joseph A. Miller, Instructor
T. H. Harris Vo-Tech School
P. O. Box 713
Opelousas, LA 70570

Mr. Huey P. Sonnier, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Cleveland Marchand, Jr., Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

GRAPHIC ARTS

Mr. Rodney Gascon, Owner
Bark Creations
408 LaBaure Avenue
Plaquemine, LA 70764

Mr. Chuck Ehlers, President
Knight Manufacturing, Inc.
412 West McNeese St.
Lake Charles, LA 70605

Mr. Willard Gore, Instructor
Shreveport-Bossier Vo-Tech Institute
P. O. Box 78527
Shreveport, LA 71137-8527

Mr. Kerry M. Curtin, Education Specialist
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

Mr. Mervin Birdwell, Curriculum Coordinator
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Ms. Pat Walton, Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

HEAVY EQUIPMENT MECHANIC

Mr. Marlin Troxell, Technical Communicator
Holt Company
P. O. Drawer 509
Reserve, LA 70084

Mr. Kenneth Monroe, Shop Foreman
T. L. James and Company
P. O. Box 1219
Ruston, LA 71270

Mr. Melvin Fruge, Vice-President of Service
Head and Engquist Equipment, Inc.
P. O. Box 52945
Baton Rouge, LA 70805

Mr. Ben Berry, Vice-President
Crawler Supply Company
P. O. Box 53306
Baton Rouge, LA 70892-3306

Mr. Reece Powell, Instructor
Port Side Vo-Tech School
P. O. Box 798
Port Allen, LA 70767

Mr. Kenneth Powers, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Donnie Tuminello, Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
1525 Fairfield Avenue
Shreveport, LA 71104

HEAVY EQUIPMENT OPERATOR

Mr. Isaac N. Carpenter, Jr.
17174 Old Jefferson Hwy
Prairieville, LA 70769

Mr. Eddie A. Spring
632 Finchley Avenue
Baton Rouge, LA 70806

Mr. Robert E. Harvey, Crane Operator
Greater Baton Rouge Port Commission
Baton Rouge Barge Terminal
Rt. 5, Box 45
Baton Rouge, LA 70807

Mr. Victor Raxsdale, Area Manager
Louisiana Paving, Inc.
P. O. Box 638
Amite, LA 70422

Mr. Joe Roberts, Superintendent
Harmony Corporation
P. O. Box 1613
Baton Rouge, LA 70821

Mr. Jim Benoit, Field Coordinator
Associated General Contractors' Representative
F. Miller and Sons, Inc.
P. O. Box 16863
Lake Charles, LA 70616

Mr. John Ballard, Instructor
Port Side Vo-Tech School
P. O. Box 798
Port Allen, LA 70767

Mr. Kenneth Powers, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Gerald Saucier, Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

INDUSTRIAL ELECTRONICS

Mr. Winston L. Fontenot, Communications Foreman
Gulf States Utilities
P. O. Box 2431
Baton Rouge, LA 70821

Mr. Roland J. Ducote, Communications Supervisor
Gulf States Utilities
P. O. Box 2431
Baton Rouge, LA 70821

Mr. Joseph A. Miller, Instructor
T. H. Harris Vo-Tech School
P. O. Box 713
Opelousas, LA 70570

Mr. Huey P. Sonnier, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Cleveland Marchand, Jr., Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

INDUSTRIAL MACHINE SHOP

Mr. Jim Bouchard, Manager
Cindex, Inc.
3010 Hawn
Shreveport, LA 71107

Mr. Richard C. Wise, Machinist
Arkla Energy Resources
P. O. Box 470
Blanchard, LA 71009

Dr. James Owens, Assistant Professor
Department of Industrial Technology
Southeastern Louisiana University
P. O. Box 847
Hammond, LA 70402

Mr. Phillip G. Alley, President
Parts Maintenance, Inc.
10624 Cherryhill Ave.
Baton Rouge, LA 70816

Mr. Huey Yaun, President
Precision Industries, Inc.
10421 Mammoth Ave.
Baton Rouge, LA 70814

Mr. Robert Broussard, Instructor
Teche Area Vo-Tech School
P. O. Box 1057
New Iberia, LA 70561-1057

Mr. Alton Wise, Instructor
Shreveport-Bossier Vo-Tech Institute
2010 North Market Street
Shreveport, LA 71137-8527

Mr. Bud Parkison, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. C. R. Bell, Jr., Assistant Director
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

INDUSTRIAL MAINTENANCE TECHNICIAN

Mr. David Eastridge, Maintenance Superintendent
Harmony Construction Corporation
2865 Mason Drive
P. O. Box 1613
Baton Rouge, LA 70821

Mr. Gilbert Pickens
Maintenance Supervisor Apprenticeship Program
Stone Container Incorporated
Mill Street
Hodge, LA 71247

Mr. Barry Johnson, Engineering Manager
Edmont
Highway 79
Rt. 1, Box EW
Haynesville, LA 71038

Mr. Frank Vitramo, Maintenance Manager
Shell Chemical
River Road
P . O. Box 500
Geismar, LA 70734

Mr. Huey P. Sonnier, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Cleveland Marchand, Jr., Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

INSTRUMENTATION

Mr. Bill Bushall, Supervisor
Maintenance Training
1535 Worsham
Zachary, LA 70791

Mr. Tom Gaskins
Bayou Steel Corporation
P. O. Box 5000
La Place, LA 70068

Mr. James Mathis, Superintendent
M.M.R. Construction Company
117261 Airline Highway
Baton Rouge, LA 70817

Mr. Thomas A. Murray, Instrument Engineer
c/o BASF Corporation
River Road
P. O. Box 457
Geismar, LA 70734

Mr. Bill Stepps
Shell Oil Company
P. O. Box 10
Norco, LA 70079

Mr. Jim Keith, Instructor
Ascension Vo-Tech School
P. O. Box 38
Sorrento, LA 70778

Mr. Joe Prince, Instructor
Northwest Louisiana Vo-Tech School
814 Constable
P. O. Box 835
Minden, LA 71058-0835

Mr. Gail Simmons, Instructor
River Parishes Vo-Tech School
P. O. Drawer AQ
Reserve, LA 70084

Mr. Huey P. Sonnier, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. W. H. Parkison, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Cleveland Marchand, Jr., Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

JEWELRY TECHNOLOGY

Mr. Johnnie Musso, Owner
Musso's Jewelers
9244 Florida Blvd.
Baton Rouge, LA 70815-1160

Ms. Robin Laurent
M. L. Kroll Jewelers
2926 Monterrey Blvd.
Baton Rouge, LA 70814

Mr. James Roberts, Instructor
Natchitoches-Central Area Vo-Tech School
P. O. Box 657
Natchitoches, LA 71458-1159

Mr. Mervin Birdwell, Curriculum Coordinator
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Ms. Phyllis Williams, Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

MARINE OPERATIONS

Mr. Garland Poarch
Zapata Gulf Marine Company
1268 Destrahan Avenue
P. O. Box 802
Harvey, LA 70058

Mr. Frank Dick, Personnel Representative
Nicor Marine, Inc.
Highway 182 Bayou Vista
P. O. Box 2291
Bayou Vista, LA 70380

Mr. Gerald Hoffman, Vice-President
Offshore Express
438 Menard Road
Houma, LA 70361

Mr. Walter Wise, Personnel Manager
Dixie Carriers, Inc.
2266 Peters Road
P. O. Box 900
Harvey, LA 70058

Mr. Yockey Bernard
c/o Mr. Tom Finn, Director of Personnel
J. Ray McDermott, Inc.
Highway 90 Amelia
P. O. Box 188
Morgan City, LA 70380

Commander Carl E. Wolcott
Marine Inspection Office
600 South Maestri Place
New Orleans, LA 70130

Mr. Floyd J. Verret, Operations Manager
Tidex, Inc.
Foot of First Street
P. O. Box 2527
Morgan City, LA 70381

Mr. V. J. Gianelloni
Louisiana Marine & Petroleum Institute
Dickson Road
Box 5033
Houma, LA 70361

Mr. Gerald Bergeron, Instructor
Terrebonne Parish Vo-Tech School
c/o Houma Air Base
No. 1 Sayre Road
Houma, LA 70360

Mr. Huey P. Sonnier, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. C. R. Bell, Jr., Assistant Director
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

MASONRY

Mr. Herman Williams, Apprentice Coordinator
Bricklayers Local No. 1
414 North Galvez Street
New Orleans, LA 70119

Mr. Maximillion Pavageau, Instructor
Baton Rouge Vo-Tech Institute
3250 N. Acadian Thruway
Baton Rouge, LA 70805

Mr. Gerald Saucier, Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

Mr. Bud Parkison, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

MEAT PROCESSING

Mr. Tom Stallings, Meat Merchandiser
A & P Food Stores
9476 Greenwell Springs Road
Baton Rouge, LA 70814

Mr. Robert Beavers, Market Manager
Brookshires Food Store
7925 Youree Drive
Shreveport, LA 71105

Mr. Terry Oquinn, Market Manager
Brookshires Food Store
1870 Airline Drive
Bossier City, LA 71010

Mr. Joseph Braud, Instructor
Folkes Vo-Tech School
P. O. Box 808
Jackson, LA 70748

Mr. Robert Johanson, Instructor
Bastrop Vo-Tech School
P. O. Box 1120
Bastrop, LA 71221-1120

Mr. Kenneth Powers, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Ms. Betty Penny, Supervisor
Health Occupations Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

OFFICE EQUIPMENT REPAIR

Mr. Phil L. Hunter
Hunter Business Machines
2405 Kirkman Street
Lake Charles, LA 70601

Mr. Michael Tims
Monroe Office Equipment Company
1001 Hudson Lane
P. O. Box 2006
Monroe, LA 71202

Mr. J. V. Wilhite
American Business Service
602 North Fifth Street
Monroe, LA 71201

Mr. Rick Turnage, District Technical Specialist
Pitney Bowes
9437 Interline Avenue
Baton Rouge, LA 70809

Mr. Woodrow Howse, Instructor
Delta Ouachita Vo-Tech Institute
West Ouachita Industrial Park
609 Vocational Parkway
West Monroe, LA 71291

Mr. Huey P. Sonnier, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Cleveland Marchand, Jr., Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

OUTDOOR POWER EQUIPMENT TECHNICIAN

Mr. George "Buddy" Ward, Service Manager
Midway Honda
Rt. 4, Box 297
DeRidder, LA 70634

Mr. Flint E. Zerangue
Zerangue's Lawn Center
3219 Johnson St.
Lafayette, LA 70503

Mr. Steve Berry, Manager
Cheek's Marine Sales
1715 Military Highway
Pineville, LA 71360

Mr. John White, Assistant Store Manager
Goudchaux's Car Care Center
9799 Cortana Place
Baton Rouge, LA 70815

Mr. Kenneth Powers, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Donnie Tuminello, Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
1525 Fairfield Ave.
Shreveport, LA 71104

PIPEFITTING

Mr. Armand Kramer, Apprenticeship Coordinator
New Orleans Pipe Trades Joint Apprenticeship Committee
2541 North Arnoult Road
P. O. Box 8428
Metairie, LA 70011

Mr. Tom Nevitt, II, Welding Engineer
McDermott, Inc.
P. O. Box 188
Morgan City, LA 70381

Mr. Clint Hawthorne, Instructor
Tallulah Vo-Tech School
Old Hwy. 65 South
Tallulah, LA 71284

Mr. Kenneth Powers, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Bud Parkison, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Cleveland Marchand, Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

PLUMBING

Mr. James Finley, President
C. N. Finley, Inc.
P. O. Box 4277
New Orleans, LA 70178

Mr. Joe Ransome, Apprentice Instructor
5485 San Juan Drive
Baton Rouge, LA 70811

Mr. Dewey J. Gremillion, Instructor
Baton Rouge Vo-Tech Institute
3250 N. Acadian Thruway
Baton Rouge, LA 70805

Mr. Bud Parkison, Curriculum Specialist
Mr. Mervin Birdwell, Curriculum Coordinator
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Gerald Saucier, Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

POWER LINE TECHNICIAN

Mr. Howard McDonald
Employ Training and Development Manager
Louisiana Power and Light
P. O. Box 60340 - MU N72
New Orleans, LA 70160

Mr. J. D. Sibley, Loss Management Administrator
Dixie Electric Co-op
P. O. Box 15659
Baton Rouge, LA 70895

Mr. Steve Goudeau, General Line Supervisor
Central Louisiana Electric Company
P. O. Box 5000
Pineville, LA 71360

Mr. Bob Burton, Instructor
Lamar Salter Vo-Tech School
Rt. 2, Box 25
Leesville, LA 71446

Mr. Kenneth Powers, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Huey P. Sonnier, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Raymond Bell, Assistant Director
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

TRUCK DRIVING

Mr. Paul Penick, East Region Safety Supervisor
D.S.I. Transport, Inc.
17220 Old Jefferson Hwy.
Baton Rouge, LA 70817

Mr. Harold Jackson, Terminal Mgr.
Steve Thompson Trucking, Inc.
3125 Harding Blvd.
Baton Rouge, LA 70807

Mr. Arthur Lonberger, Safety Director
SAIA Motor Freight Lines
P. O. Box A, Station 1
Houma, LA 70363

Mr. Kenneth Powers, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Cleveland Marchand, Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

UPHOLSTERING

Mr. Mike Denicola, President
Don's Furniture Upholstering
4256 Plank Road
Baton Rouge, LA 70805

Mr. David Crofton, Owner
Professional Trim Shop
831 N. Market Street
Shreveport, LA

Ms. Bobby LeBlanc, Instructor
Memorial Area Vocational School
Louisiana Correctional Institute for Women (LCIW) Branch
P. O. Box 26
St. Gabriel, LA

Ms. Peggy Carr, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Kenneth Powers, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Ms. Phyllis Williams, Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

WELDING

Mr. George Fairbanks, Vice-President
Physical Testing and Welding Related Services
Scientific Testing Laboratories, Inc.
2703 Weller Avenue
Baton Rouge, LA

Mr. P. T. Delaune, EF-34, Engineering Specialist
Boeing Petroleum Services, Inc.
850 South Clearview Parkway
New Orleans, LA 70123

Mr. Bruce Hallila, Senior Welding Engineer
Avondale Industries
Shipyard Division
P. O. Box 50280
New Orleans, LA 70150

Mr. John E. Ball, Jr., Instructor
Slidell Vo-Tech
P. O. Box 827
Slidell, LA 70459-0827

Mr. Kenneth Powers, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Bud Parkison, Curriculum Specialist
Vocational Curriculum Development and
Research Center
P. O. Box 1159
Natchitoches, LA 71458-1159

Mr. Cleveland Marchand, Supervisor
Trade and Industrial Education
Office of Vocational Education
Louisiana State Department of Education
P. O. Box 94064
Baton Rouge, LA 70804-9064

LOUISIANA VOCATIONAL-TECHNICAL EDUCATION

MASTER LISTING OF COMPETENCY-BASED COURSES

Course Title	Length	CIP Code
AGRICULTURE		
1. Agricultural Mechanics	1688 Hours (15 months)	01.0204
2. Forest Technology	1688 Hours (15 months)	03.0401
3. Horticulture	1688 Hours (15 months)	01.0601
BUSINESS		
4. Account Clerk	788 Hours (7 months)	07.0102
5. Computer Operator	1350 Hours (12 months)	07.0302
6. Computer Programmer	2025 Hours (18 months)	07.0305
7. Hospitality and Tourism	225 Hours (2 months)	08.0901
8. Salesmanship	675 Hours (6 months)	08.0706
9. Secretary	1463 Hours (13 months)	07.0606
10. Stenographer	1350 Hours (12 months)	07.0607
11. Terminal System Operator	1013 Hours (9 months)	07.0303
12. Word Processor Operator	1013 Hours (9 months)	07.0608
COMMUNICATIONS		
13. Television Production	2025 Hours (18 months)	10.0104
CONSUMER, PERSONAL, AND MISCELLANEOUS SERVICES		
14. Barbering	1575 Hours (14 months)	12.0402
15. Cosmetology	1350 Hours (12 months)	12.0403
ENGINEERING		
16. Biomedical Equipment Technology	2700 Hours (24 months)	15.0401
17. Civil Engineering Technology	2250 Hours (20 months)	15.0201
18. Drafting and Design Technology	2700 Hours (24 months)	15.0202
19. Electromechanical Technology	2475 Hours (22 months)	15.0403
20. Motor Vessel Engineer	1350 Hours (12 months)	15.0804
21. Nondestructive Testing	1350 Hours (12 months)	15.0702
22. Process Technician	1350 Hours (12 months)	15.0699
HEALTH OCCUPATIONS		
23. Emergency Medical Technician (EMT) - Paramedic	1350 Hours (12 months)	17.0206
24. Medical Laboratory Technician - Certificate	1575 Hours (14 months)	17.0305
25. Nurse Assistant	281 Hours (2½ months)	17.0602
26. Practical Nursing	*1500-1600 Hours (14 months)	17.0605
27. Respiratory Therapy Technician	1575 Hours (14 months)	17.0819
28. Surgical Technology	1575 Hours (14 months)	17.0211
29. Ward Clerk	338 Hours (3 months)	17.0513
HOME ECONOMICS		
30. Child Care	1350 Hours (12 months)	20.0201
31. Commercial Sewing	1350 Hours (12 months)	20.0303
32. Culinary Occupations	1350 Hours (12 months)	20.0403

Course Title	Length	CIP Cod
33. Dietary Manager	1350 Hours (12 months)	20.040
34. Homemaker's Aide	675 Hours (6 months)	20.060
TRADE AND INDUSTRIAL		
35. Air Conditioning/Refrigeration	2700 Hours (24 months)	47.0201
36. Appliance Repair	1350 Hours (12 months)	47.0106
37. Auto Body Repair	2025 Hours (18 months)	47.0603
38. Automotive Technician	2700 Hours (24 months)	47.0604
39. Aviation Maintenance Technology	1913 Hours (17 months)	47.0602
40. Band and Circular Saw Filing	2025 Hours (18 months)	48.059
41. Carpentry	2025 Hours (18 months)	46.0201
42. Commercial Art	2700 Hours (24 months)	48.020
43. Communications Electronics	2700 Hours (24 months)	47.0103
44. Computer Electronics	2700 Hours (24 months)	47.0104
45. Consumer Electronics Technician	2700 Hours (24 months)	47.0199
46. Diesel Mechanics	1350 Hours (12 months)	47.0605
47. Electrician	1688 Hours (15 months)	46.030
48. Graphic Arts	1350 Hours (12 months)	48.020
49. Heavy Equipment Mechanic	1350 Hours (12 months)	47.0302
50. Heavy Equipment Operator	1125 Hours (10 months)	49.0202
51. Industrial Electronics	2700 Hours (24 months)	47.0105
52. Industrial Machine Shop	1800 Hours (16 months)	48.050
53. Industrial Maintenance Technician	2700 Hours (24 months)	47.0303
54. Instrumentation	2700 Hours (24 months)	47.0401
55. Jewelry Technology	2025 Hours (18 months)	48.060
56. Marine Operations	1350 Hours (12 months)	49.0301
57. Masonry	1800 Hours (16 months)	46.0102
58. Meat Processing	1013 Hours (9 months)	48.040
59. Office Equipment Repair	2250 Hours (20 months)	47.0102
60. Outdoor Power Equipment Technician	1013 Hours (9 months)	47.0606
61. Pipefitting	1350 Hours (12 months)	46.0502
62. Plumbing	1350 Hours (12 months)	46.050
63. Power Line Technician	1350 Hours (12 months)	46.030
64. Truck Driving	506 Hours (4½ months)	49.020
65. Upholstering	1350 Hours (12 months)	48.030
66. Welding	1800 Hours (16 months)	48.050

*Louisiana State Board of Practical Nurse Examiners requirement

AGRICULTURE

Agricultural Mechanics
Forest Technology
Horticulture

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Agriculture

Course Title: Agricultural Mechanics

CIP Code: 01.0204

Course Length 1688 Clock Hours - 15 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical shop experience concerned with providing the knowledge and skills in which a mechanic maintains, repairs and overhauls farm machinery and equipment. The course prepares the individual to select, safety use and maintain hand and power tools. The content includes, but is not limited to, tractors, combines, balers, sprayers, and gasoline and diesel engines. Safe and efficient work practices are emphasized; basic occupational and employability skills are an integral part of instruction. The content is organized into competency-based units of instruction which specify occupational competencies the individual must successfully complete.

Units of Instruction:

I. Occupational Introduction
II. Human Relations
III. Safety
IV. Business Practices
V. Tools and Equipment
VI. Service Literature
VII. Engines
VIII. Air Conditioning and Heating
IX. Transmissions and Differentials
X. Brake, Steering, and Wheel Systems
XI. Power Transfer Systems
XII. Hydraulic Systems
XIII. Tillage Equipment
XIV. Planters
XV. Combines and Harvesters
XVI. Hay and Forage Harvesting Equipment
XVII. Job Seeking Skills

Curriculum Competency Outline

UNIT I: Occupational Introduction

Competencies:

1. Describe the field of agricultural machinery mechanics.
2. Identify the working conditions involved with agricultural machinery mechanics.
3. Identify job hazards associated with agricultural machinery maintenance and repair.
4. Describe salary and benefits involved with employment as an agricultural machinery mechanic.
5. Describe job opportunities available for the agricultural machinery mechanic.
6. Identify initial investment requirements for professional mechanics.

UNIT II: Human Relations

Competencies:

1. Demonstrate willingness to learn.
2. Write legibly.
3. Listen attentively.

4. Prepare written communication.
5. Exhibit dependability.
6. Demonstrate punctuality.
7. Follow rules and regulations.
8. Read and comprehend written communication and information found in technical manuals.
9. Use technical manuals effectively.
10. Maintain clean and orderly work area.
11. Demonstrate personal hygiene and cleanliness.
12. Comply with safety and health rules.
13. Select correct tools and equipment.
14. Utilize equipment correctly.
15. Work productively with others.
16. Exhibit pride and loyalty.
17. Demonstrate problem-solving skills.
18. Show empathy, respect, and support for others.
19. Apply communication skills to good customer relations.

UNIT III: Safety

Competencies:

1. Use proper lifting techniques.
2. Wear safety glasses.
3. Wear personal protective gear.
4. Wear proper clothing.
5. Report accidents.
6. Keep shop and work area clean.
7. Locate and know how to use fire extinguishers.
8. Demonstrate a knowledge of safe operation of oxyfuel equipment.
9. Demonstrate a knowledge of multi-media first aid.
10. Demonstrate a knowledge of results of having an accident.
11. Use and dispose of toxic fluids and chemicals according to safety regulations and hazardous waste requirements.
12. Maintain hand tools.
13. Use hoists, chains and lifting devices.
14. Maintain an organized work area.
15. Follow proper operating procedures for tools and equipment.
16. Demonstrate safe operating procedures while operating motorized equipment.
17. Demonstrate knowledge of the safe operation procedures for a forklift.
18. Use jack stands and blocking procedures.
19. Demonstrate a knowledge of battery safety.
20. Operate a steam cleaner safely.
21. Apply shop and equipment safety rules.

UNIT IV: Business Practices

Competencies:

1. Identify terms associated with business practices.
2. Demonstrate a knowledge of inventory control and management.
3. Demonstrate a knowledge of the cost factors involved in doing business.
4. Maintain service vehicles.
5. Maintain tools and test equipment.
6. Demonstrate a knowledge of the effects of productivity in service operations.
7. Demonstrate a knowledge of codes and regulations governing employer and employee relations.
8. Demonstrate a knowledge of local, state, and federal tax requirements for doing business.
9. Complete service reports.

10. Complete job tickets.
11. Receive and inventory deliveries.
12. Meet flat-rate requirements for service and repairs.

UNIT V: Tools and Equipment

Competencies:

1. Identify terms associated with mechanical tools.
2. Identify basic hand tools.
3. Demonstrate proper care and use of hand tools.
4. Identify and demonstrate proper care and use of torque wrenches.
5. Identify and demonstrate proper care and use of air impact wrenches.
6. Measure parts using standard and metric measurement systems.
7. Demonstrate the ability to measure parts using various precision measuring instruments.
8. Calibrate precision measuring tools.
9. Clean and store precision measuring tools.

UNIT VI: Service Literature

Competencies:

1. Identify terms associated with operators' parts and service manuals.
2. Demonstrate the ability to use service manuals to assist in performing scheduled and unscheduled maintenance.
3. Use parts manual.
4. Demonstrate a knowledge of parts ordering.
5. Identify technical and service manual updates.
6. Read and interpret operator's manual.
7. Follow troubleshooting techniques prescribed in technical service manuals.

UNIT VII: Engines

Competencies:

1. Describe the basic principles of diesel operation.
2. Describe the principles of operation of 2-stroke cycle and 4-stroke cycle engines.
3. Identify various types of diesel engines.
4. Differentiate between various types of combustion chambers.
5. Describe the purpose and function of diesel air intake and exhaust systems.
6. Identify various types of air cleaners used on agricultural equipment.
7. Maintain and service oil bath type air cleaners.
8. Maintain and service dry type air cleaners.
9. Identify blowers used on diesel engines and explain their function.
10. Remove and replace blower assembly.
11. Disassemble and assemble blower assembly.
12. Describe principle of operation and purpose of turbochargers.
13. Remove, disassemble, repair, reassemble and replace turbochargers.
14. Diagnose air intake and exhaust system problems.
15. Describe purpose and function of cooling system.
16. Perform pressure test on cooling system.
17. Trace coolant flow throughout engine.
18. Clean radiator coils and fins.
19. Identify and service various types of water filters used on diesel engine cooling systems.
20. Test coolant with hydrometer.
21. Flush and clean the cooling system.
22. Remove, test, and replace thermostat.
23. Remove, replace, and adjust fan belts.
24. Remove and replace radiator and hoses.
25. Remove and replace water pumps.

26. Select appropriate types of antifreeze.
27. Select and add inhibitors to coolant.
28. Troubleshoot cooling system problems.
29. Service and test storage batteries on 12 and 24 volt systems.
30. Charge 12 and 24 volt batteries.
31. Identify cranking system components and describe their functions.
32. Remove, repair, and replace starter motors.
33. Remove and replace solenoid switches.
34. Diagnose cranking system problems.
35. Identify charging system components and describe their function.
36. Perform tests to determine if charging system is functional.
37. Demonstrate the ability to adjust voltage regulator according to manufacturer's specifications.
38. Remove and replace amperage gauge.
39. Demonstrate the ability to polarize a tractor generator.
40. Remove and replace bearings in a generator and/or alternator.
41. Remove, test, and replace diodes.
42. Check, remove, and replace heat sink.
43. Remove and replace glow plugs and relays.
44. Troubleshoot wiring circuits.
45. Diagnose charging system problems.
46. Identify types of lubrication systems.
47. Identify lubrication system components and describe their functions.
48. Describe types of oil pressure indicators.
49. Check engine oil pressure.
50. Select type of engine oil according to engine service.
51. Change engine oil and oil filter.
52. Cut open and inspect oil filters.
53. Service oil coolers.
54. Describe function of and service by-pass valves.
55. Test and service pressure relief valves.
56. Remove, inspect, and replace oil pump assemblies.
57. Maintain and describe importance of maintenance records.
58. Diagnose lubrication system problems.
59. Identify types of fuel systems and describe the function of the fuel system components.
60. Demonstrate a knowledge of fuel oil types and additives.
61. Perform routine maintenance of fuel systems.
62. Remove and replace fuel strainers and filter elements.
63. Bleed fuel system.
64. Identify types of engine governors.
65. Describe the function of and adjust various types of governors.
66. Demonstrate the ability to repair hydraulic governors.
67. Demonstrate the ability to repair mechanical governors.
68. Install and adjust mechanical and hydraulic governors.
69. Identify and describe types of fuel injection systems.
70. Remove, repair, and replace fuel injectors.
71. Time fuel injectors.
72. Install and time fuel injector pump to engine.
73. Perform "pop" test on fuel injectors.
74. Perform engine cylinder compression test.
75. Demonstrate the ability to check engine crankcase pressure.
76. Remove engine from chassis.
77. Disassemble, clean, inspect and reassemble a diesel engine.
78. Measure parts of engine and compare to original specifications.

79. Remove and replace cylinder head.
80. Remove and replace camshaft.
81. Remove and replace crankshaft and crankshaft bearings.
82. Inspect and measure cylinder head components.
83. Demonstrate the ability to grind and reface valves.
84. Demonstrate the ability to replace valve guides.
85. Demonstrate the ability to grind and/or replace valve seats according to manufacturer's specifications.
86. Demonstrate the ability to adjust valve clearance according to manufacturer's specifications.
87. Perform check on cylinder head and block for warpage.
88. Demonstrate the ability to clean cylinder block, oil passages and pistons.
89. Remove, clean, inspect, and service piston and rod assemblies.
90. Deglaze cylinder.
91. Torque engine parts to manufacturer's specifications.
92. Demonstrate the ability to diagnose engine performance.
93. Perform diesel engine tune-ups.
94. Demonstrate the ability to evaluate exhaust smoke color to determine malfunctions.
95. Diagnose and correct cause(s) of lack of power.
96. Troubleshoot engine for no-start conditions.
97. Troubleshoot engine for start but no-run condition.
98. Diagnose, locate, and correct conditions causing engine knock.
99. Demonstrate the ability to locate and correct fuel injector malfunctions.
100. Demonstrate the ability to overhaul various types of diesel engines used in agriculture.
101. Describe the basic principles of operation of a gasoline engine.
102. Disassemble, identify parts, measure parts and compare with specification, and reassemble gasoline engine.
103. Diagnose condition of, replace and/or repair positive crankcase ventilation system components.
104. Remove and replace fuel system components.
105. Demonstrate the ability to overhaul a one-, two- and four-barrel carburetor.
106. Demonstrate the ability to measure fuel flow and pressure.
107. Diagnose and repair fuel system problems.
108. Identify components of a typical charging system.
109. Remove and replace generator and/or alternator units.
110. Diagnose and repair ignition switch malfunctions.
111. Remove, inspect, and replace ignition secondary wiring.
112. Demonstrate the ability to set timing.
113. Remove and replace ignition distributor and adjust.
114. Demonstrate the ability to check advance timing mechanisms.
115. Demonstrate the ability to remove and replace gasoline engine (in-frame).
116. Diagnose valve train and head malfunctions.
117. Demonstrate the ability to overhaul gasoline engines.
118. Demonstrate the ability to diagnose and repair fuel, electrical, and engine operational problems.

UNIT VIII: Air Conditioning and Heating

Competencies:

1. Identify terms associated with air conditioning and heating equipment.
2. Identify components of an air conditioning system and describe the function of each.
3. Perform visual inspection of system.
4. Evacuate and recharge an air conditioning system.
5. Perform operational test of an air conditioning system.
6. Diagnose and repair air conditioning system component malfunctions.

UNIT IX: Transmissions and Differentials

Competencies:

1. Identify components of a typical transmission and differential system.
2. Diagnose clutch problems.
3. Remove, repair, and replace clutch assembly.
4. Diagnose manual transmission problems.
5. Remove, repair, and replace manual transmissions.
6. Diagnose hydraulic transmission problems.
7. Remove and repair hydraulic transmission.
8. Diagnose differential problems.
9. Remove, repair and replace differentials.
10. Demonstrate the ability to repair straight axles, pinions, and planetary gears.
11. Demonstrate the ability to service and repair tracks.

UNIT X: Brake, Steering, and Wheel Systems

Competencies:

1. Identify the components of a typical brake system.
2. Identify the components of a typical steering system.
3. Identify terms associated with brake, steering, and wheel systems applicable to agricultural equipment.
4. Inspect lines and fittings for wear and/or defects.
5. Demonstrate a knowledge of the operation of a typical tractor brake system.
6. Demonstrate the ability to test power brake unit and vacuum supply.
7. Demonstrate the ability to remove and replace brake shoes.
8. Demonstrate the ability to overhaul and/or replace wheel cylinders.
9. Demonstrate the ability to overhaul and/or replace brake drums and hubs.
10. Demonstrate the ability to bleed and adjust a hydraulic brake system.
11. Perform static inspections and functional tests.
12. Demonstrate the ability to repair power brake unit.
13. Inspect, service, and repair steering components.
14. Identify factors affecting tire ballasts.
15. Identify factors determining need for additional ballast on farm equipment.

UNIT XI: Power Transfer Systems

Competencies:

1. Identify terms associated with power transfer systems.
2. Identify types and applications of power transfer systems.
3. Identify primary components of power transfer systems.
4. Describe the operation and function of various power transfer systems.
5. Troubleshoot power transfer systems.
6. Adjust chains.
7. Adjust belts.
8. Repair chains.
9. Repair variable speed drives.
10. Align chain and sprocket.
11. Clean and lubricate chain.
12. Clean sprocket.
13. Install chain idler.
14. Replace belt sheave.
15. Replace V-belts.
16. Replace flat pickup drive belt.
17. Replace sprocket.
18. Replace elevator paddles.
19. Replace speed control.
20. Replace hydrostatic drive charge pressure control valve.
21. Replace hydrostatic drive charge pump.

22. Replace hydrostatic drive directional control valve.
23. Replace hydrostatic drive high pressure relief valve.
24. Grease gearbox.
25. Install oil gaskets.
26. Install oil seals.
27. Replace clutch friction disk.
28. Replace countershaft.
29. Replace transmission case.
30. Replace planetary gear.
31. Replace shaft.
32. Replace synchronizing unit.
33. Replace universal joint.
34. Adjust clutch linkage.
35. Replace gear drives.
36. Realign shaft and bearings.
37. Replace bearings.
38. Replace dynamic seals.
39. Replace plain bearings (bushings).
40. Replace static seals.
41. Troubleshoot bearings.
42. Align belt pulleys.
43. Troubleshoot and repair Geneva mechanisms.
44. Troubleshoot and repair Scotch yoke assemblies.
45. Identify safety hazards associated with the service and repair of power transfer systems.
46. Apply safety practices.

UNIT XII: Hydraulic Systems

Competencies:

1. Identify terms associated with hydraulic systems.
2. Identify various types and applications of hydraulic systems on agricultural machinery.
3. Identify the primary components of a hydraulic system.
4. Identify types of fluids used with hydraulic systems.
5. Describe the operation and function of various components of a hydraulic system.
6. Identify factors affecting hydraulic system operation.
7. Adjust pressure relief valve.
8. Bleed air from hydraulic system.
9. Change hydraulic filter.
10. Flush hydraulic system.
11. Drain and refill hydraulic system.
12. Hone hydraulic cylinder walls.
13. Replace check valve.
14. Replace hydraulic hoses.
15. Replace hydraulic cylinders.
16. Replace hydraulic fittings.
17. Replace hydraulic lines.
18. Replace hydraulic piston.
19. Replace packing.
20. Repair hydraulic motors.
21. Replace hydraulic pumps.
22. Service hydraulic valves.
23. Repair hydraulic pumps.
24. Troubleshoot hydraulic actuator.
25. Replace hydraulic actuator.
26. Troubleshoot pressure regulators.

27. Inspect pressure control valves.
28. Null hydraulic servo valve.
29. Test accumulator charge.
30. Recharge accumulator.
31. Replace defective accumulator.
32. Troubleshoot heat exchanger.
33. Measure pressure within hydraulic system.
34. Measure flow within hydraulic system.
35. Troubleshoot hydraulic systems.
36. Interpret control diagrams for hydraulic systems.
37. Diagnose malfunctions of hydraulic systems using test and measurement equipment.
38. Connect hydraulic components to machines.
39. Identify safety hazards associated with the service and repair of hydraulic systems.
40. Apply safety practices.

UNIT XIII: Tillage Equipment

Competencies:

1. Identify terms associated with tillage equipment.
2. Differentiate between primary and secondary tillage equipment.
3. Identify various types of primary tillage equipment.
4. Identify various types of secondary tillage equipment.
5. Identify the major components of primary tillage equipment.
6. Describe the operation and function of primary tillage equipment.
7. Identify the major components of secondary tillage equipment.
8. Describe the operation and function of secondary tillage equipment.
9. Identify accessory equipment used with primary and secondary tillage equipment (tool bars, transport equipment).
10. Troubleshoot primary tillage equipment problems.
11. Remove, inspect and repair/replace defective mechanical components.
12. Remove, inspect and repair/replace defective hydraulic system components.
13. Remove, inspect and repair/replace soil engaging tools.
14. Remove and repair/replace moldboard plow components.
15. Perform adjustments on primary tillage equipment.
16. Troubleshoot secondary tillage equipment problems.
17. Remove, inspect and repair/replace defective components.
18. Perform field adjustments/repairs on primary and secondary tillage equipment.
19. Identify safety hazards associated with the servicing and repair of primary and secondary tillage equipment.
20. Apply safety practices.

UNIT XIV: Planters

Competencies:

1. Identify terms associated with planters.
2. Identify various types of row crop, grain drill, broadcast, and specialized planters.
3. Identify planter components.
4. Identify planter drives.
5. Identify furrow openers.
6. Identify seed-metering, seed placement mechanisms, seed depth control, and seed covering devices.
7. Describe the operation and function of planters and component parts.
8. Identify primary grain drill component parts.
9. Describe the operation and function of grain drills and component parts.
10. Identify and describe the calibration of grain drills.
11. Describe the operation of broadcast planters.
12. Identify the primary components of broadcast planters.
13. Identify the primary components of specialized planters.
14. Describe the operation and function of specialized planters and component parts.

15. Troubleshoot row crop planter, grain drill planter, broadcast, specialized planter, and mechanical problems.
16. Replace disc furrow covers.
17. Adjust furrow covers.
18. Adjust hitch.
19. Adjust row marker.
20. Adjust furrow opener.
21. Replace plate type sprockets.
22. Calibrate seed placement rate.
23. Calibrate pressurized air seed metering system.
24. Calibrate finger-pickup seed metering system.
25. Calibrate seed-plate metering system.
26. Adjust for desired depth of seed placement.
27. Adjust attachments.
28. Install monitor assembly.
29. Service and troubleshoot monitor assembly.
30. Troubleshoot field problems.
31. Identify safety hazards associated with servicing and repairing planters.
32. Apply safety practices.

UNIT XV: Combines and Harvesters

Competencies:

1. Identify terms associated with combines and harvesters.
2. Identify various types of combines and harvesters.
3. Identify specialty crop combines and harvesters.
4. Identify various types of special attachments for combines.
5. Identify crop varieties and harvesting capabilities of combines and harvesters.
6. Identify the components of various types of combines and harvesters.
7. Describe the operation and function of the various components found on harvesters.
8. Describe the operation and function of the harvesting system components of a combine.
9. Identify the power systems found on combines and harvesters.
10. Identify the operational controls of combines and harvesters.
11. Stabilize concave leveling mechanism.
12. Replace concave.
13. Replace cutterbar on combine.
14. Replace feeder conveyor.
15. Replace gathering chains.
16. Interchange combine grain and corn head.
17. Replace cylinder rotor on combine.
18. Replace bars on snapping plates on combine.
19. Replace straw walkers.
20. Replace threshing cylinder.
21. Replace threshing fans.
22. Adjust corn harvester cylinder to concave.
23. Adjust cylinder cut-off bar.
24. Adjust drag chains and links.
25. Adjust elevator chains.
26. Adjust floating shoes.
27. Adjust reel speed.
28. Adjust sieves.
29. Adjust snapping rolls.
30. Adjust stripper plates.
31. Adjust table balance springs.
32. Lubricate feeder chain.

33. Adjust slip clutches.
34. Replace snapping rolls.
35. Time gathering chains.
36. Replace cutterbar on mower-conditioner/windrower.
37. Replace guard on mower-conditioner/windrower.
38. Replace hay conditioner universal joints.
39. Replace mower knife sections.
40. Replace mower ledger plates.
41. Replace mower wear plates.
42. Troubleshoot the power systems of combines and harvesters.
43. Troubleshoot the harvesting system of combines.
44. Troubleshoot harvester/windrower problems.
45. Identify safety hazards associated with servicing and repair of combines and harvesters.
46. Apply safety practices.

UNIT XVI: Hay and Forage Harvesting Equipment

Competencies:

1. Identify terms associated with hay and forage harvesting equipment.
2. Identify various types of hay and forage harvesting equipment.
3. Identify various types of mowers.
4. Describe mower cutting methods and operation.
5. Identify primary mower components.
6. Identify types of hay conditioners.
7. Describe operation and function of hay conditioners.
8. Identify primary components of hay conditioners.
9. Identify various types of mower-conditioners and windrowers.
10. Describe operation and function of mower-conditioners and windrowers.
11. Identify primary components of mower-conditioners and windrowers.
12. Identify various types of rakes.
13. Describe operation and function of rakes.
14. Identify the primary components of rakes.
15. Identify various types of balers.
16. Describe operation and function of balers.
17. Identify the primary components of balers.
18. Identify types of bale handling and storage equipment.
19. Identify primary components and describe operation of bale handling and storage equipment.
20. Identify various types of round balers and movers.
21. Describe round baler operation.
22. Identify primary components of round balers.
23. Identify types of stack wagons and stack movers.
24. Identify primary components and describe operation and function of stack wagons and stack movers.
25. Identify types of hay cubers.
26. Describe operation and function of hay cubers.
27. Identify primary components of hay cubers.
28. Identify various types of forage harvesters.
29. Describe operation and function of forage harvesters.
30. Identify primary components of forage harvesters.
31. Identify various types of self-unloading forage wagons.
32. Describe operation and function of self-unloading forage wagons.
33. Identify primary components of self-unloading forage wagons.
34. Identify various types of crop hand blowers and describe operation and function.
35. Identify primary components of blowers.

36. Troubleshoot mechanical components of balers.
37. Replace round baler compression roll spring.
38. Replace round baler floor and floor channel.
39. Replace round baler rollers.
40. Adjust round baler knife arm.
41. Adjust twine baler needles.
42. Adjust twine baler slip clutches (drive line and pickup drive).
43. Adjust twine baler tucker fingers.
44. Adjust twine baler twine disc.
45. Adjust twine baler bale care tension.
46. Replace twine baler bill hook.
47. Replace hay dog springs.
48. Replace twine baler pin in bill hook pinion.
49. Replace twine baler finger rod.
50. Replace twine baler knife.
51. Sharpen twine baler knife cutting edge.
52. Time feeder.
53. Time plunger.
54. Replace round baler belts.
55. Adjust knives on twine baler.
56. Troubleshoot mechanical components of mowers, mower-conditioners, and windrowers.
57. Troubleshoot mechanical components of rakes, stack handlers/movers.
58. Troubleshoot mechanical components of hay cubers.
59. Troubleshoot mechanical components of forage harvesters, self-unloading forage wagons, and blowers.
60. Identify safety hazards associated with the servicing and repair of hay and forage harvesting equipment.
61. Apply safety practices.

UNIT XVII: Job Seeking Skills

Competencies:

1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.
5. Write a letter of application.
6. Fill out a job application.
7. Participate in a mock interview.
8. Write a follow-up letter.
9. Conduct a job search.
10. Write a letter of resignation.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Agriculture **Course Title:** Forest Technology

CIP Code: 03.0401 **Course Length** 1688 Clock Hours - 15 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical shop experience to prepare students for employment in a variety of jobs in the field of Forest Technology or to provide supplemental training for persons previously or currently employed in related forest technology occupations.

The Forest Technology course prepares individuals in a general way to produce, protect, and manage timber and specialty forest crops; maintain, operate, and repair related equipment and machinery; harvest and transport trees as a crop and select, grade and market forest raw materials for converting into a variety of consumer goods, and to utilize the forest for multiple purposes such as game preserves and recreation. Includes instruction in surveying; map reading; aerial photography and interpretation; mensuration; forest protection; and ecology.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The content is organized into competency-based units of instruction which specify occupational competencies which the student must successfully complete.

Units of Instruction:

I. Introduction to Forest Technology
II. Dendrology
III. Mathematics for Forest Technicians
IV. Computer Function
V. Interpersonal Skills
VI. Forest Surveying
VII. Map Reading and Preparation
VIII. Aerial Photography and Interpretation
IX. Mensuration
X. Silviculture
XI. Timber Harvesting
XII. Forest Protection: Insects and Disease
XIII. Forest Protection: Fire Use and Control
XIV. Forest Ecology and Wildlife Habitat
XV. Related Forest Management Areas
XVI. Final Project
XVII. Job Seeking Skills

Curriculum Competency Outline

UNIT I: Introduction to Forest Technology

Competencies:

1. Identify terms associated with the field of forest technology.
2. Demonstrate a knowledge of job requirements.
3. Demonstrate a knowledge of the working conditions of a forest technician.
4. Demonstrate a knowledge of career opportunities.
5. Demonstrate a knowledge of the history of the Louisiana forest industry.
6. Identify physical and mental limitations associated with forestry operations.
7. Identify state and federal requirements for motor vehicle operator's license.
8. Identify safety hazards associated with forestry operations.

UNIT II. Dendrology

Competencies:

1. Identify terms associated with dendrology.
2. Identify various types of trees.
3. Name trees by their common names.
4. Name trees by their botanical names.
5. Identify tree varieties by their leaf.
6. Identify tree varieties by their twig.
7. Identify tree varieties by their bark.
8. Identify tree varieties by their bloom.
9. Identify tree varieties by their fruit.
10. Identify tree varieties by their bud.
11. Make a leaf collection.
12. Identify the parts of a tree.
13. Describe how a tree grows.
14. Describe how trees reproduce.
15. Describe the scientific classification of trees.
16. Demonstrate the ability to use a tree identification key.

UNIT III: Mathematics for Forest Technicians

Competencies:

1. Identify terms associated with forest mathematics.
2. Perform basic mathematical computations.
3. Determine areas.
4. Determine volumes.
5. Solve problems using formulas.
6. Solve ratio problems.
7. Determine dot tally.
8. Demonstrate knowledge of United States Standard Units of Measurement.
9. Solve triangulation problems.
10. Perform calculations using a scientific calculator.

UNIT IV: Computer Function

Competencies:

1. Identify terms associated with computer function.
2. Identify the various types of computer function.
3. Identify the applications of computer functions.
4. Load a system.
5. Demonstrate the use of an operating system.
6. Demonstrate the use of operating system utilities.

UNIT V: Interpersonal Skills

Competencies:

1. Identify terms associated with interpersonal skills.
2. Demonstrate a willingness to learn.
3. Demonstrate a professional attitude.
4. Demonstrate the ability to be a good listener.
5. Demonstrate the ability to follow oral and written instructions.
6. Demonstrate the ability to communicate instructions accurately and effectively.
7. Demonstrate high reliability in the performance of duties.
8. Demonstrate problem-solving skills.
9. Demonstrate punctuality.
10. Exhibit pride and loyalty.
11. Comply with safety and health rules.
12. Demonstrate personal hygiene and cleanliness.
13. Show empathy, respect, and support for others.
14. Demonstrate effective writing skills.
15. Write a management report.

16. Research an oral report.
17. Plan an oral report.
18. Present an oral report.

UNIT VI: Forest Surveying

Competencies:

1. Identify terms associated with forest surveying.
2. Identify the various types of equipment used in surveying.
3. Identify the major components of surveying equipment.
4. Demonstrate the ability to use surveying equipment in the performance of duties to meet industry standards.
5. Maintain surveying equipment.
6. Explain the use of pacing.
7. Determine a distance by pacing.
8. Determine a distance by chaining.
9. Describe the use of bearings and azimuths in forest surveyings.
10. Demonstrate the ability to use a compass effectively.
11. Demonstrate the ability to set up and use a transit.
12. Determine angular errors.
13. Determine linear errors.
14. Run an open traverse using a transit and tape.
15. Run a closed traverse using a transit and tape.
16. Determine an unknown distance using the stadia method.
17. Record field notes legibly and concisely.
18. Describe the factors affecting surveying accuracy and precision.
19. Interpret legal descriptions.
20. Describe land surveying techniques.
21. Determine elevations by differential leveling.
22. Research a legal description.
23. Draw a sketch of a legal description.
24. Locate bench marks.
25. Identify safety hazards associated with forest surveying operations.
26. Apply safety practices.

UNIT VII: Map Reading and Preparation

Competencies:

1. Identify terms associated with map reading and preparation.
2. Identify metes and bounds.
3. Number sections within designated townships.
4. Subdivide townships into their component subdivisions.
5. Write legal descriptions.
6. Locate land descriptions on maps.
7. Plot land descriptions on maps.
8. Identify map symbols.
9. Read and interpret maps.
10. Locate tracts using maps.
11. Research legal descriptions at courthouse.
12. Identify basic drawing equipment.
13. Demonstrate the ability to use drawing equipment effectively.
14. Determine map scale for drawing.
15. Collect field notes for map preparation.
16. Draw maps to scale.

UNIT VIII: Aerial Photography and Interpretation

Competencies:

1. Identify terms associated with aerial photography.
2. Determine photo scale.
3. Identify man-made objects from aerial photographs.
4. Identify natural features portrayed on aerial photographs.
5. Determine timber types.
6. Divide land on aerial photographs using quadrangle maps.
7. Locate tracts on aerial photographs.
8. Determine acreage using dot grid.
9. Draw timber type map using aerial photographs.
10. Determine elevations shown on aerial photographs.
11. Describe care of aerial photographs.
12. Identify equipment associated with using aerial photographs.

UNIT IX: Mensuration

Competencies:

1. Identify terms associated with forest mensuration.
2. Identify the various tools used in forest mensuration.
3. Identify the basic components of various forest mensuration tools.
4. Demonstrate the ability to read a compass.
5. Use a compass to plot a course to a designated location.
6. Measure/estimate tree diameters.
7. Measure bark thicknesses.
8. Measure/estimate total tree heights.
9. Measure/estimate merchantable timber heights.
10. Determine tree age and growth rates.
11. Explain form class.
12. Determine form class.
13. Explain site index.
14. Determine site index.
15. Determine stand density.
16. Explain volume tables.
17. Identify volume tables.
18. Use volume tables.
19. Demonstrate pacing techniques.
20. Calibrate pacing.
21. Determine pacing accuracy on varied uneven terrain.
22. Itemize factors that affect pacing accuracy.
23. Describe a strip cruise.
24. Describe a plot cruise.
25. Describe a point sample cruise.
26. Describe a 100% tree count.
27. Lay out and perform a strip cruise.
28. Lay out and perform a plot cruise.
29. Lay out and perform a point sample cruise.
30. Lay out and perform a 100% tree count.
31. Explain a dot tally.
32. Perform a dot tally.
33. Differentiate forest products.
34. Describe different timber types.
35. Construct a timber type map.
36. Calculate acreage.
37. Calculate timber volumes.
38. Calculate a stand table.

39. Construct a stand table.
40. Evaluate cruise results.
41. Identify cruise specifications.
42. Identify scaling techniques.
43. Perform scaling techniques.
44. Identify sources of error in performing timber cruises.
45. Demonstrate ability to keep records.
46. Identify safety hazards associated with forest surveying operations.
47. Apply safety practices.

UNIT X: Silviculture

Competencies:

1. Identify terms associated with silviculture.
2. Identify silviculture systems.
3. Identify types of thinning operations.
4. Describe thinning operations.
5. Describe marking systems.
6. Mark trees for thinning operations.
7. Describe cleaning operations.
8. Describe liberation cutting.
9. Describe improvement cutting.
10. Describe harvest cutting techniques.
11. Lay out harvest cuts.
12. List factors affecting selection of trees for marking operations.
13. Identify equipment needed for trimming and harvesting operations.
14. Identify safety equipment needed for trimming and harvesting operations.
15. Perform cull-tree removal.
16. Perform care and maintenance of equipment.
17. Describe site preparation processes.
18. Identify equipment used for mechanical site preparation.
19. Identify equipment used for chemical site preparation.
20. Identify equipment used in site preparation using fire.
21. Observe various site preparation techniques and applications.
22. Describe natural reforestation process.
23. Describe artificial reforestation process.
24. Observe reforestation procedures.
25. Perform reforestation procedures.
26. Describe seed care and handling.
27. Describe seedling care and handling.
28. Determine stocking level.
29. List advantages/disadvantages of hand planting.
30. List advantages/disadvantages of mechanical planting.
31. Evaluate planting job and survival rate.
32. Identify safety hazards associated with silviculture.
33. Apply safety practices.

UNIT XI: Timber Harvesting

Competencies:

1. Identify terms associated with timber harvesting.
2. Describe a basic timber harvesting operation.
3. Classify harvesting systems.
4. Describe shortwood systems.
5. Identify and list equipment used in shortwood systems.
6. Describe longwood systems.
7. Identify and list equipment used in longwood systems.
8. Identify forest product merchantability.

9. Identify and list equipment used for felling, limbing, and bucking.
10. Identify and list skidding equipment used in timber harvesting operations.
11. Identify and list loading equipment used in timber harvesting operations.
12. Identify and list prehauling equipment used in timber harvesting operations.
13. Identify and list hauling equipment used in timber harvesting operations.
14. Identify other methods of transportation available for timber hauling operations.
15. Develop a timber harvesting plan for a designated tract.
16. Observe harvesting operations.
17. Evaluate harvesting operations.
18. Prepare bid forms.
19. Prepare logging contracts.
20. Identify marketing aspects.
21. Identify safety hazards associated with timber harvesting.
22. Apply safety practices.

UNIT XII: Forest Protection: Insects and Disease

Competencies:

1. Identify terms associated with insects and disease aspects of forest protection
2. Identify bark beetles.
3. Locate and identify bark beetle damage.
4. Identify leaf cutters.
5. Locate and identify leaf cutter damage.
6. Identify wood borers.
7. Locate and identify wood borer damage.
8. Identify twig borers.
9. Locate and identify damage done by twig borers.
10. Describe the damage of cone and seed feeders.
11. Describe the damage of gall formers.
12. Describe the methods of bark beetle control.
13. Describe the economic impact of insect damage.
14. Identify foliage diseases.
15. Locate and identify fusiform rust disease.
16. Locate and identify red heart disease.
17. Identify stem, branch, and cone disease.
18. Identify vascular wilts.
19. Identify root and butt rot.
20. Locate and identify annosus root rot.
21. Describe control methods for brown split needle blight.
22. Describe control methods for fusiform rust.
23. Describe control methods for red heart rot.
24. Describe control methods for annosus root rot.
25. Describe control methods for oak wilt.
26. Identify weather factors that cause tree damage.
27. Describe the adverse effects of air pollution.
28. Identify mechanical damage.
29. Describe mechanical damage.
30. List laws governing pesticide applications.
31. Describe the safe use and handling of pesticides.
32. Apply pesticides.
33. Identify safety hazards associated with insect and disease control.
34. Apply safety practices.

UNIT XIII: Forest Protection: Fire Use and Control

Competencies:

1. Identify terms associated with fire use and control aspects of forest protection.
2. Describe factors related to fire weather.
3. Determine fire danger rating.

4. Identify and list equipment needed to determine fire danger rating.
5. Complete a fire danger rating form.
6. List and describe wildfire causes.
7. Identify and list factors affecting fire behavior and spread.
8. Describe different types of fire.
9. Describe parts of a fire.
10. Describe fire detection methods.
11. Describe fire crew organization.
12. Identify and list fire fighting equipment and tools.
13. Perform preventive maintenance on fire fighting tools and equipment.
14. Identify safe use and handling of fire fighting tools and equipment.
15. Describe a fire suppression operation.
16. Describe the sequence of events in a fire suppression operation.
17. Prepare a fire report.
18. Describe methods of evaluating and reporting fire damage.
19. Describe fire prevention methods.
20. State the purpose of prescribed burning.
21. Identify the uses and applications of prescribed burning.
22. Describe the environmental effects of prescribed burning.
23. Describe weather conditions associated with prescribed burning.
24. Identify and describe firing techniques.
25. Describe the importance of smoke management.
26. Plan a prescribed burn.
27. Write a prescribed burn.
28. Execute a prescribed burn.
29. Evaluate a prescribed burn.
30. Identify safety hazards associated with all aspects of fire use and control.
31. Apply safety practices.

UNIT XIV: Forest Ecology and Wildlife Habitat

Competencies:

1. Identify terms associated with forest ecology and wildlife habitat.
2. Describe how forest management operations affect wildlife habitat.
3. Describe how endangered species affect forest management operations.
4. Describe methods used to enhance wildlife habitat.
5. Describe methods used for watershed management.
6. Describe methods for preserving forest aesthetics.

UNIT XV: Related Forest Management Areas

Competencies:

1. Identify terms associated with related forest areas.
2. Identify the factors that affect Christmas tree production.
3. Determine the requirements for establishing Christmas tree production in the local area.
4. Identify the management and marketing aspects of Christmas tree production.
5. Identify the harvesting and shipping techniques to be utilized.
6. Describe the impact of Christmas tree production on the forest industry.
7. Describe the characteristics of urban forestry.
8. Identify the factors that affect urban forestry.
9. Identify the social, environmental, and ecological impact of urban forest on the community.
10. Identify the management requirements of urban forestry.
11. Identify the various types of forest recreation.
12. Describe the management requirements involved in forest recreation.
13. Describe the ecological factors affecting management of forest recreational areas.
14. Identify the factors to be determined in selecting a forest recreational area.

15. Describe the impact of human occupation of forest recreational areas.
16. Describe the economic impact of forest recreational areas.
17. Describe the characteristics of the third forest.
18. Describe the ecological and environmental impact of the third forest.
19. Identify the factors that created the third forest.
20. Describe the management requirements of the third forest.
21. Describe the economic impact of the third forest.
22. Describe the characteristics of a forest range.
23. Identify factors affecting forest range management.
24. Describe the ecological and environmental impact of forest ranges.
25. Identify the requirements for forest range management.
26. Identify the economic impact of forest range management.

UNIT XVI: Final Project

Competencies:
1. Locate a designated tract of land for final project.
2. Cruise tract of land for final project.
3. Compute timber volume.
4. Estimate economic value of merchantable timber on tract.
5. Prepare a management plan.
6. Submit a written management plan for evaluation.

UNIT XVII: Job Seeking Skills

Competencies:
1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.
5. Write a letter of application.
6. Complete a job application.
7. Participate in a mock interview.
8. Write a follow-up letter.
9. Conduct a job search.
10. Write a letter of resignation.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education
Competency-Based Course Outline

Program Area: Agriculture **Course Title:** Horticulture

CIP Code: 01.0601 **Course Length** 1688 Clock Hours - 15 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical laboratory experience to prepare students for employment in a variety of jobs in the field of Horticulture or to provide supplemental training for persons previously or currently employed in Horticulture.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The content is organized into competency-based units of instruction which specify occupational competencies which the student must successfully complete.

The Horticulture course generally prepares individuals to produce, process, and market plants, shrubs, and trees used principally for ornamental, recreational, and aesthetic purposes and to establish, maintain, and manage horticultural enterprises such as arboriculture, floriculture, greenhouse operation and management, landscaping, nursery operation and management, and turf management. The course also includes instruction in machinery and equipment necessary for each horticultural enterprise.

Units of Instruction:
I. Introduction to Horticulture
II. Horticulture Math
III. Human Relations
IV. Plant Identification
V. Plant Science
VI. Basic Agronomy
VII. Plant Propagation
VIII. Lawn, Garden, and Nursery Equipment
IX. Plant Pest Control
X. Plant Maintenance
XI. Olericulture
XII. Pomology
XIII. Turfgrass
XIV. Landscaping
XV. Nursery Management
XVI. Greenhouse Management
XVII. Retail Floristry
XVIII. Entrepreneurship
XIX. Job Seeking Skills

Curriculum Competency Outline

UNIT I: Introduction to Horticulture

Competencies:
1. Define horticulture.
2. Describe the history of horticulture in the United States.
3. Describe the different areas of horticultural specialization.

4. Describe the importance of horticulture.
5. Describe the economic impact of horticulture.
6. Identify the laws and regulations associated with horticultural occupations.
7. Describe safety practices that will have to be considered while performing horticultural operations.
8. Define nomenclature associated with the field of horticulture.
9. Describe climate and hardiness zones in Louisiana.
10. Identify adverse conditions in horticultural occupations.
11. Identify physical and mental limitations in performing horticultural tasks.
12. Identify career opportunities.
13. Determine career objectives.

UNIT II: Horticulture Math

Competencies:
1. Perform mathematical computations and conversions.
2. Complete sales slips.
3. Complete invoices.
4. Complete statements.
5. Solve problems involving discounts.
6. Solve problems involving mark-ups.
7. Perform cash register operations.
8. Solve problems involving seed mixture ratios.
9. Solve problems involving surface areas.
10. Solve problems involving volumes.
11. Solve problems involving pesticide formulas and applications.
12. Solve problems involving fertilizer quantities and applications.
13. Solve problems involving construction materials.
14. Determine construction materials needed for a given project.
15. Solve problems involving nursery stock.
16. Solve problems involving greenhouses and surrounding areas.
17. Solve problems involving landscape bidding.
18. Perform measurements using scales.
19. Calculate cost of providing horticultural services.
20. Prepare an estimate sheet for a given project.
21. Complete a bid form.
22. Prepare a simple contract for a landscape project or design.

UNIT III: Human Relations

Competencies:
1. Identify terms associated with human relations.
2. Demonstrate a willingness to learn.
3. Demonstrate a professional attitude.
4. Demonstrate the ability to be a good listener.
5. Demonstrate the ability to follow oral and written instructions.
6. Demonstrate the ability to communicate instructions accurately and effectively.
7. Demonstrate high reliability in the performance of duties.
8. Demonstrate problem-solving skills.
9. Demonstrate punctuality.
10. Exhibit pride and loyalty.
11. Comply with safety and health rules.
12. Demonstrate personal hygiene and cleanliness.
13. Show empathy, respect, and support for others.
14. Write legibly.

UNIT IV: Plant Identification

Competencies:

1. Identify terms associated with plant identification.
2. Describe the methods and means used to identify plants.
3. Identify plants by the International Code of Botanical Nomenclature Standards.
4. Identify plants by the International Code of Botanical Nomenclature for Cultivated Plants Standards.
5. Identify plants by their common/vernacular names.
6. Demonstrate a knowledge of the cultural recommendations for various types of plants.
7. Demonstrate a knowledge of the growth habits of various types of plants.
8. Identify the various methods of plant propagation.
9. Identify the uses of various types of plants.
10. Differentiate between binomial and varietal plant names.

UNIT V: Plant Science

Competencies:

1. Identify terms associated with plant science.
2. Describe the science of taxonomy.
3. Explain the classification of plants in the plant kingdom.
4. Identify internal morphological features.
5. Identify external morphological features.
6. Identify methods of plant growth and development.
7. Identify methods of plant reproduction.
8. Identify environmental/cultural effects on plant growth and reproduction.
9. Identify internal physiological features.
10. Identify external physiological features.

UNIT VI: Basic Agronomy

Competencies:

1. Identify terms associated with agronomy.
2. Identify soil types.
3. Identify plant growth media.
4. Solve soil-related problems.
5. Describe soil-water relationship.
6. Calculate fertilizer requirements.
7. Calculate fertilizer costs.
8. Convert soluble dry fertilizer to parts per million (ppm) quantities.
9. Convert pounds of fertilizer to actual pounds of elements.
10. Perform leachate soil sample test.
11. Take soil samples.
12. Interpret soil sample results and make recommendations.
13. Identify relationship between pH and plant nutrients available.
14. Test for water quality and interpret results.
15. Determine usability of water.
16. Demonstrate a knowledge of the effects of fertilizer on soil pH.

UNIT VII: Plant Propagation

Competencies:

1. Identify terms associated with plant propagation.
2. Identify plant propagation tools.
3. Sow seed in containers.
4. Sow fine seed in containers.
5. Grow, prick-out, and harden off seedlings.
6. Determine quality and variety of seeds to order or sow.
7. Collect seeds and develop procedures for successful germination.
8. Scarify seeds by acid treatment, mechanical, and water-soaking methods.

9. Prepare seeds for germination by means of stratification.
10. Demonstrate the ability to use a mechanical seeder, plug popper, dibble board, and growth chamber in plant propagation operations.
11. Propagate by using suckers from undisturbed, isolated roots.
12. Propagate by the use of natural suckering and division.
13. Prepare plants for subsequent root cuttings.
14. Propagate plants by using root cuttings.
15. Propagate a tuber artificially.
16. Propagate a rhizome artificially.
17. Propagate a bulb by inducing bulblet formation artificially.
18. Propagate a bulb by scaling artificially.
19. Propagate a plant by means of division.
20. Propagate a plant by the use of offsets.
21. Propagate a plant by using runners.
22. Propagate plants by simple layering.
23. Propagate plants by air layering.
24. Propagate plants by tip layering.
25. Propagate plants by stooling.
26. Propagate plants by French layering.
27. Propagate plants by leaf-bud cuttings.
28. Propagate plants by the use of heel and mallet cuttings.
29. Propagate plants by the use of softwood cuttings.
30. Propagate plants by the use of greenwood cuttings.
31. Propagate plants by the use of semiripe wood cuttings.
32. Propagate plants by the use of evergreen cuttings.
33. Propagate plants by the use of hardwood cuttings.
34. Propagate plants by the use of vine-eye cuttings.
35. Propagate conifers.
36. Propagate plants using root hormones.
37. Propagate plants by using nodal and inter-nodal cuttings.
38. Propagate plants by using leaf petiole cuttings.
39. Propagate plants by using midrib and lateral vein cuttings.
40. Propagate plants by using the leaf slashing method.
41. Propagate plants by using leaf squares.
42. Propagate plants by using monocot leaves.
43. Propagate plants by using whip-and-tongue graftings.
44. Propagate plants by using cleft graftings.
45. Propagate plants by using side-wedge graftings.
46. Propagate plants by using the side veneer method.
47. Propagate plants by using the shield budding method.
48. Propagate plants by using the chip budding method.
49. Describe tissue culture propagation.
50. Determine nozzle types and sizes of mist systems used for propagation purposes.
51. Determine misting duration and frequency in propagation operations.
52. Design a misting system.
53. Clean and service a misting system.
54. Explain the principles of fogging systems.
55. Describe the operation of a fogging system in a plant propagation operation.
56. Identify safety hazards associated with plant propagation operations.
57. Apply safety practices.

UNIT VIII: Lawn, Garden, and Nursery Equipment

Competencies:

1. Identify terms associated with lawn, garden, and nursery equipment.
2. Identify various types of lawn and garden tools.
3. Sharpen edge cutting tools.
4. Perform preventive maintenance on lawn and garden tools.

5. Use lawn and garden tools.
6. Identify various types of lawn management equipment.
7. Perform preventive maintenance on lawn management equipment.
8. Sharpen edge cutting attachments.
9. Operate lawn management equipment.
10. Identify various types of garden management tools.
11. Perform preventive maintenance on garden management tools.
12. Sharpen edge cutting attachments.
13. Operate garden management equipment.
14. Identify various types of nursery equipment.
15. Perform preventive maintenance on nursery equipment.
16. Operate nursery equipment.
17. Identify safety hazards associated with lawn, garden, and nursery equipment.
18. Apply safety practices.

UNIT IX: Plant Pest Control

Competencies:

1. Identify terms associated with plant pest control.
2. Describe the effects of too much light on low-light-intensity plants.
3. Describe the effects of soil reaction on plant growth and development.
4. Describe the effects of overfertilization on plant growth and development.
5. Demonstrate a knowledge of the laws and regulations governing pesticide uses and applications.
6. Determine the effects of environment on insect population.
7. Identify beneficial insects.
8. Identify destructive insects.
9. Identify damage caused by insects.
10. Select chemical control methods to be implemented for specific insect control.
11. Select biological control methods to be implemented for specific insect control.
12. Apply chemical/biological control methods.
13. Determine spray schedule based on emergence time and incubation period.
14. Identify factors that determine whether a plant is beneficial or a weed pest.
15. Identify various types of weed pests.
16. Determine life cycle of weed pests.
17. Identify various types of herbicides and describe their mode of action in plant pest control.
18. Select chemical/cultural control to be used on plant pests.
19. Identify the optimum time of application.
20. Calibrate hand-held spray equipment.
21. Calibrate mechanical spray equipment.
22. Apply chemical/cultural control.
23. Identify the four categories of plant disease agents.
24. Identify the various common plant diseases.
25. Identify the causal agents.
26. Select chemical/cultural control method.
27. Apply control method.
28. Identify various vertebrate pests.
29. Identify control methods.
30. Select control method to be used for control of a designated vertebrate pest.
31. Identify safety hazards associated with plant pest control.
32. Apply safety practices.

UNIT X: Plant Maintenance

Competencies:

1. Identify terms associated with plant maintenance.
2. Maintain flower beds and edging.
3. Determine watering schedule and water plants.
4. Perform seasonal maintenance.
5. Identify pruning tools.
6. Maintain pruning tools.
7. Prune ornamental deciduous trees and shrubs.
8. Prune broadleaf evergreens.
9. Prune coniferous evergreens.
10. Trim a hedge.
11. Prune ornamental flowering plants.
12. Ball and burlap a tree or a shrub.
13. Perform backfill operations.
14. Transplant a balled and burlapped plant.
15. Transplant seedlings.
16. Transplant a bare root tree or shrub.
17. Transplant container stock.
18. Apply fertilizers.
19. Apply herbicides.
20. Apply pesticides.
21. Mix and apply mulch media.
22. Guy and stake a tree or a shrub.
23. Brace bare root trees.
24. Stake and tie flowering plants.
25. Brace overload limbs.
26. Identify various plant winterizing techniques.

UNIT XI: Olericulture

Competencies:

1. Identify terms associated with olericulture.
2. Identify various types of vegetables grown in Louisiana.
3. Select vegetable varieties to be planted.
4. Identify planting dates.
5. Identify planting methods.
6. Prepare seed beds.
7. Plant seeds.
8. Transplant seedlings.
9. Determine fertilizer needs.
10. Apply fertilizer.
11. Determine water requirements.
12. Water plants.
13. Identify various types of garden pests.
14. Identify chemical/cultural methods used to control garden pests.
15. Apply chemical/cultural control methods.
16. Perform cultural practices to maintain vegetables grown.
17. Harvest vegetable crop.
18. Grade vegetables.
19. Identify storage methods/facilities.
20. Prepare vegetables for storage.
21. Store vegetables.
22. Package vegetables for market.
23. Ship vegetables.
24. Develop a vegetable market.

UNIT XII: Pomology

Competencies:

1. Identify terms associated with pomology.
2. Identify fruit and nut varieties adapted to Louisiana.
3. Identify environmental factors affecting fruit and nut production.
4. Identify advantages of using specific root stocks.
5. Identify diseases affecting fruit and nut production.
6. Recommend treatments for diseases.
7. Identify harmful insects affecting fruit and nut production.
8. Recommend treatments to control insect problems.
9. Determine fertilizer requirements.
10. Apply recommended fertilizer treatment.
11. Perform pruning techniques.
12. Plan an orchard layout.
13. Identify winterizing techniques.
14. Harvest fruit and nut crops.
15. Grade fruits and nuts.
16. Identify storage methods/facilities.
17. Prepare fruits and nuts for storage.
18. Store fruits and nuts.
19. Package fruits and nuts for market.
20. Ship fruits and nuts.
21. Develop a fruit and nut market.

UNIT XIII: Turfgrass

Competencies:

1. Identify terms associated with turfgrass.
2. Identify permanent grasses used in Louisiana.
3. Identify temporary grasses used in Louisiana.
4. Identify environmental factors that affect turfgrasses.
5. Select appropriate turfgrass based on uses and environment.
6. Identify lawn renovation procedures.
7. Identify procedures for new lawn establishment.
8. Identify turfgrass planting techniques.
9. Determine fertilizer requirements for various types of turfgrass.
10. Apply recommended fertilizer treatment for turfgrass.
11. Identify equipment used in maintaining turfgrass.
12. Determine turfgrass watering requirements.
13. Identify various types of lawn irrigation systems.
14. Design a lawn irrigation system.
15. Operate lawn management equipment.

UNIT XIV: Landscaping

Competencies:

1. Identify terms associated with landscaping.
2. Identify the tools and equipment used in landscaping operations.
3. Recognize, identify, and define various plant material used in landscaping operations.
4. Demonstrate the ability to use drawing instruments to plan and lay out a landscape design.
5. Demonstrate the ability to sketch a landscape design.
6. Differentiate between landscape design, installation, and maintenance.
7. Differentiate between outdoor/indoor landscaping and state the nine design requirements.
8. Demonstrate the ability to analyze an outdoor site and determine the landscaping potential.
9. Demonstrate the ability to analyze an indoor site and determine interior scaping potentials.

10. Demonstrate a knowledge of the outdoor room concept and apply it to a design.
11. Identify the factors that affect an outdoor/indoor scape design.
12. Plan a landscape design.
13. Demonstrate the ability to plant container-grown, ball and burlap, and bare-root trees.
14. Identify six uses of shrubs in landscape design.
15. Differentiate between annuals, biennials, and perennials.
16. Select plants/seeds for designated landscaping operations.
17. Identify the five uses of enclosure materials.
18. Identify the four basic types of surfacing materials.
19. Describe the advantages/disadvantages of hard paving/soft paving.
20. Calculate the dimensions of outdoor steps.
21. Identify various natural/manufactured enrichment items.
22. Prepare a complete cost estimate for a landscape installation.
23. Prepare a complete cost estimate for a landscape maintenance contract.
24. Demonstrate a knowledge of tree and shrub pruning requirements.
25. Prune trees and shrubs.
26. Select twenty varieties of plants suitable for interior landscaping.
27. Demonstrate the ability to provide water and nutrients to indoor plants.
28. Demonstrate the ability to use a pH meter and interpret the results.
29. Demonstrate the ability to use a light meter and interpret the results.
30. Demonstrate the ability to calculate "parts-per-million" fertilization rates.
31. Demonstrate the ability to keep indoor plants clean.
32. Identify six types of insects common to indoor plants.
33. Recommend appropriate treatments to control insects.
34. Identify diseases of indoor plants.
35. Recommend appropriate treatments to control diseases.
36. Identify local/state codes governing landscaping operations.
37. Identify safety hazards associated with landscaping operations.
38. Apply safety practices.

UNIT XV: Nursery Management

Competencies:

1. Identify terms associated with nursery management.
2. Identify nursery facility components.
3. Identify the functions and characteristics of nursery support structures to include: office area, media component area, barns/storage structures, water supply, propagation facility, potting area, container bed area, field growing area, points of entry/exit roadways, and shipping/holding areas.
4. Design a nursery facility layout.
5. Design a drainage system.
6. Design an irrigation system to include: wells (water) and pumps, hydraulic/hydrostatic pressure, valves, trimming devices, timers, electrical wiring requirements, sprinkler heads, piping (PVC & metal), principles of installation, and water pond management.
7. Maintain irrigation equipment.
8. Winterize irrigation equipment.
9. Operate irrigation equipment.
10. Identify safety hazards associated with nursery management.
11. Apply safety practices.

UNIT XVI: Greenhouse Management

Competencies:

1. Identify terms associated with greenhouse management.
2. Identify various types of greenhouse structures.
3. Identify various types of greenhouse coverings.

4. Install/replace greenhouse covers.
5. Identify the factors that determine the placement of a greenhouse.
6. Identify the various parts of a greenhouse.
7. Identify various types of greenhouse equipment.
8. Identify greenhouse plants by the International Code of Botanical Nomenclature standards.
9. Identify greenhouse plants by the International Code of Botanical Nomenclature for Cultivated Plants standards.
10. Identify greenhouse plants by their common/vernacular names.
11. Identify the factors that affect plant growth/development.
12. Identify the cultural practices that affect plant growth/development.
13. Identify greenhouse soil requirements.
14. Identify greenhouse soil propagation media.
15. Prepare greenhouse soil propagation media.
16. Identify soil sterilization equipment.
17. Sterilize greenhouse soil.
18. Identify fertilizers and nutrients used for feeding greenhouse plants.
19. Determine fertilizer/nutrient requirements of various greenhouse plants.
20. Apply recommended fertilizers/nutrients to greenhouse plants.
21. Identify the various types of plant propagation used in greenhouse operations.
22. Describe plant sexual propagation and identify the factors that affect plant sexual propagations.
23. Describe asexual propagation and identify the factors that affect asexual propagation.
24. Describe and identify the purpose of plant regulators.
25. Propagate plants by cuttings.
26. Propagate plants by layering.
27. Propagate plants by separation.
28. Propagate plants by division.
29. Propagate plants by grafting.
30. Propagate plants by budding.
31. Select and grow plants for cut flower production.
32. Select and grow plants for pot flower production.
33. Select and grow plants for bedding plant production.
34. Select and grow plants for outdoor foliage plant production.
35. Select and grow plants for indoor foliage plant production.
36. Select and grow plants for totem poles.
37. Select and grow plants for terrariums and bottle gardens.
38. Prepare terrariums for marketing.
39. Prepare bottle gardens for marketing.
40. Select and grow plants for succulent plant production.
41. Identify environment control devices/equipment for greenhouses.
42. Identify the factors that determine the need for environmental control in greenhouses.
43. Identify the types of watering equipment used in greenhouse operations.
44. Identify the types of plant feeding equipment used in greenhouse operations.
45. Determine watering requirements for various greenhouse operations.
46. Perform plant watering operations according to schedules/plant needs.
47. Identify insects, diseases, and weed pests affecting greenhouse operations.
48. Determine control methods necessary to control greenhouse insects, disease, and weed pests.
49. Identify the factors that influence greenhouse production costs.
50. Demonstrate a knowledge of the requirements for scheduling of planting, growing, and harvesting of plants in greenhouse operations.
51. Identify damage to plants by insects, disease, and weeds.
52. Apply corrective treatments.

53. Prepare plants for marketing.
54. Label, price, display, and advertise marketable plants.
55. Determine production costs.
56. Identify safety hazards associated with greenhouse operations.
57. Apply safety practices.

UNIT XVII: Retail Floristry

Competencies:

1. Identify terms associated with retail floristry.
2. Explain the symbolic meaning of specific flowers and plants.
3. Identify the principles of floral design.
4. Identify tools and equipment required for retail floristry operations.
5. Identify various types of materials required for retail floristry operations.
6. Identify twenty (20) flowering and twenty (20) foliage plants that are used for daily holiday retail florist sales.
7. Participate in a horticulture floriculture meeting.
8. Construct floral arrangements using proper materials.
9. Prepare flowers to be kept fresh until used.
10. Apply principles of floral design and color in arranging flowers.
11. Receive and complete orders for weddings, funerals, and other occasions.
12. Estimate cost and time of preparing arrangement, spray, wreath, or corsage.
13. Perform procedures for keeping a centerpiece fresh.
14. Judge floral arrangements.
15. Prepare advertisements, displays, and other merchandising schemes for sales promotion.
16. Prepare, arrange, and maintain refrigerator, window, and other floral displays.
17. Receive and unpack a shipment of new materials and process them for storage display.
18. Inventory merchandise, plants, and other stock.
19. Package, label, and review orders for correct delivery.
20. Accurately operate cash register, calculator, billing machine, and charge card equipment.
21. Take and complete orders properly.
22. Receive and transcribe telephone telegraph orders accurately.
23. Use pricing policies and practices.
24. Complete in-store sales.
25. Advise customers on proper plant care and handling, seasonal availability, and price fluctuations.
26. Package and wrap merchandise for customers.
27. Address cards and tags for flowers, potted plants, and arrangements.
28. Identify and locate wire services located in retail florist's market area.
29. Handle customer complaints and objections tactfully.
30. Identify safety hazards associated with retail floristry operations.
31. Apply safety practices.

UNIT XVIII: Entrepreneurship

Competencies:

1. Identify terms associated with business practices.
2. Demonstrate a knowledge of inventory control and management.
3. Demonstrate a knowledge of the cost factors involved in doing business.
4. Maintain horticultural service vehicle inventory.
5. Maintain horticultural service vehicles.
6. Maintain tools and test equipment.
7. Demonstrate a knowledge of the effects of productivity in horticultural service operations.
8. Demonstrate a knowledge of codes and regulations governing employer and employee relations.
9. Demonstrate a knowledge of local, state, and federal tax requirements for doing business.

10. Demonstrate a knowledge of horticultural technician's license requirements.
11. Obtain required horticultural technician's license from local/state agencies.
12. Complete job scope forms and documents.
13. Participate in a horticulture/floriculture meeting.
14. Conduct a meeting using correct parliamentary procedure.
15. Prepare and present a speech.
16. Harvest, grade, and pack pot plants and nursery stock plants for market.
17. Identify and label plants properly.
18. Prepare advertisements, displays, and other merchandising schemes for sales promotion.
19. Prepare, arrange, and maintain refrigerator, window, and other floral displays.
20. Receive and unpack a shipment of new materials and process them for storage and/or display.
21. Inventory merchandise, plants, and other stock.
22. Package, label, and review orders for correct delivery.
23. Plan and organize work schedules.
24. Estimate job costs.
25. Prepare billing for work performed.
26. Keep accurate records.
27. Compute production costs and receipts.
28. Identify insurance, licensing, and quarantine regulation guidelines for federal, state, and local governments.
29. Accurately prepare and file tax returns, Social Security records, and office records.
30. Use credit properly.
31. Accurately operate cash register, calculator, billing machine, and charge card equipment.
32. Use pot plant sleeving device to wrap potted plants.
33. Take and complete orders properly.
34. Receive and transcribe telephone/telegraph orders accurately.
35. Use pricing policies and practices.
36. Complete in-store sales.
37. Advise customers on proper plant care and handling, seasonal availability, and price fluctuations.
38. Package and/or wrap merchandise for customers.
39. Address cards and tags for flowers, potted plants, and arrangements.
40. Handle customer complaints and objections tactfully.

UNIT XIX Job Seeking Skills

Competencies:

1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resumé.
4. Write a letter of introduction.
5. Write a letter of application.
6. Complete a job application.
7. Participate in a mock interview.
8. Write a follow-up letter.
9. Conduct a job search.
10. Write a letter of resignation.

BUSINESS

Account Clerk
Computer Operator
Computer Programmer
Hospitality and Tourism
Salesmanship
Secretary
Stenographer
Terminal System Operator
Word Processor Operator

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Business (Office Occupations) **Course Title:** Account Clerk

CIP Code: 07.0102 **Course Length** 788 Clock Hours - 7 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical experience to prepare students for employment as account clerks or to provide supplemental training for persons previously or currently employed as account clerks.

This course prepares individuals to perform paraprofessional duties supporting the accountant in organizing, designing, and computing numerical and financial data.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The content is organized into competency-based units of instruction which specify occupational competencies which the student must successfully complete.

Units of Instruction:

I. English
II. Math
III. Vocabulary
IV. Introduction to Computers
V. Personal Development and Human Relations
VI. Keyboarding
VII. Recordkeeping
VIII. Office Procedures
IX. Filing
X. General Accounting
XI. General Ledger
XII. Cash Receipts
XIII. Cash Disbursements
XIV. Accounts Receivable
XV. Accounts Payable
XVI. Payroll
XVII. Computerized Accounting
XVIII. Job Seeking Skills

Curriculum Competency Outline

UNIT I: English

Competencies:

1. Review fundamentals of English.
2. Identify parts of speech.
3. Demonstrate good sentence structure.
4. Demonstrate proficiency in the use of punctuation and capitalization.
5. Demonstrate proficiency in using reference materials.
6. Compose brief memos and short letters.

UNIT II: Math

Competencies:

1. Review fundamentals of math.
2. Demonstrate proficiency in addition, subtraction, multiplication and division using fractions, decimals, and percentages without the calculator.
3. Interpret, analyze, and solve word problems related to business situations.
4. Perform addition, subtraction, multiplication, and division with decimals on the calculator using the touch system.
5. Demonstrate a working knowledge of these four math functions in the following applications: discounts and net amounts; markup and markdown; prorating; interest, notes, and discounts; and payroll.

UNIT III: Vocabulary

Competencies:

1. Apply the correct spelling, pronunciation and syllabication of frequently used and business related words.
2. Use appropriate vocabulary in communication skills.
3. Select the best word from synonyms, antonyms, and homonyms.
4. Learn and apply rules for plurals, possessives, prefixes, suffixes, and word endings.
5. Demonstrate proficiency in the use of a dictionary.
6. Acquire a working knowledge of the definitions of frequently used and business related words.

UNIT IV: Introduction to Computers

Competencies:

1. Learn basic microcomputer terminology.
2. Describe and identify the functions of microcomputers.
3. Understand the use of the function keys.
4. Demonstrate the proper power-up and power-down sequence as well as perform simple tasks related to word processing, data base, spread sheet, and graphics programs.
5. Save and print documents.

UNIT V: Personal Development and Human Relations

Competencies:

1. Perform self-evaluation to determine strengths and weaknesses.
2. Develop good grooming and personal hygiene.
3. Demonstrate ability to follow written and verbal instructions.
4. Develop a healthy self-esteem.
5. Describe importance of the following professional qualities when given various office situations: honesty, loyalty, courtesy, cooperation, alertness, ambition, punctuality, interest, involvement, patience, tact, confidence, sense of humor, dependability, reliability, flexibility, and initiative.
6. Demonstrate the following proper telephone techniques:
   - Answers the telephone
   - Places local and long-distance calls
   - Screens telephone calls
   - Transfers or refers telephone calls
   - Records messages
   - Maintains records of long-distance calls
   - Uses various directories
   - Operates intercom system
   - Operates paging system
   - Operates multiline system
7. Demonstrate the following proper telephone etiquette: courtesy, voice control, diction, expression, vocabulary, and discretion.

8. Describe acceptable conduct in the following personal relationships: employee-employer, employee-coworker, and employee-public.

UNIT VI: Keyboarding

Competencies:

1. Develop the ability to operate the electronic typewriter and/or microcomputer efficiently.
2. Demonstrate appropriate techniques for all key reaches.
3. Type simple letters, tables, and reports.
4. Develop adequate proofreading skills.
5. Type at a minimum rate of 25 wpm from straight copy for 3 minutes with 6 or fewer errors.
6. Make corrections using typing eraser, correction tapes, and correction fluids.

UNIT VII: Recordkeeping

Competencies:

1. Identify and complete business related forms.
2. Demonstrate ability to maintain efficient records, manually or electronically, for cashiers, banking, petty cash, students and families, retail sales clerks, a purchasing department, wholesale sales department, payroll department, and small retail business and other related records.
3. Demonstrate proficiency in penmanship.

UNIT VIII: Office Procedures

Competencies:

1. Understand and demonstrate the following procedures for handling incoming mail:
    A. Opens and stamps mail for date/time
    B. Sorts mail for distribution
    C. Maintains current routing guide/distribution lists
2. Understand and demonstrate the following procedures for handling outgoing mail:
    A. Stamps and seals envelopes
    B. Uses postage scales and U.S. Postal manuals
    C. Calculates postage rates and purchases postage
    D. Operates postage meter
3. Describe the various procedures for shipping materials.
4. Describe on-the-job situations where safety-consciousness must be demonstrated.
5. Practice safety in all jobs.
6. Demonstrate proper fire prevention techniques to be used at the job site.
7. Demonstrate ability to use copy machine.
8. Assemble, collate, and staple duplicated material.
9. Exhibit an awareness of office supplies, their uses and sources.
10. Recognize the importance of confidentiality and privacy laws.
11. Understand the value and importance of the following machines in business: calculator, typewriter, copy machine, transcribing machine, postage machine, microcomputer, telephone, and others.
12. Learn and apply rules for alphabetic indexing.
13. Learn and apply rules for numeric indexing.

UNIT IX: Filing

Competencies:

1. Demonstrate proper filing procedure including collecting material to be filed, inspecting for time stamp/release mark, indexing, coding, cross-referencing, sorting, placing cards in file and arranging records in file.
2. Learn and apply rules for subject and geographical filing.
3. Understand the criteria by which records are created, stored, retrieved, retained, and disposed of.

4. Demonstrate proper procedures for the operation and control of manual and electronic storage systems.
5. Demonstrate a knowledge of various filing systems.
6. Describe basic filing equipment.

UNIT X: General Accounting

Competencies:
1. Demonstrate knowledge of accounting terminology.
2. Exhibit knowledge of the accounting cycle.
3. Identify various steps in the inventory cycle.
4. Describe various inventory systems.
5. Describe various methods of costing inventory.
6. Demonstrate a knowledge of the skill needed for effective collections.

UNIT XI: General Ledger

Competencies:
1. Describe the functions of the general ledger.
2. Describe the account components of the general ledger.
3. Describe the relationship of the general ledger to the financial statements.
4. Reconcile bank cash balance to the general ledger cash balance.
5. Reconcile all other subsidiary ledgers to the general ledger.

UNIT XII: Cash Receipts

Competencies:
1. Record cash receipts in a journal.
2. Prepare deposit.
3. Post cash receipts to accounts receivable ledger when using accrual method.
4. Post cash receipts to the general ledger.

UNIT XIII: Cash Disbursements

Competencies:
1. Write checks.
2. Record cash disbursements in a journal.
3. Code disbursements to the proper accounts.
4. Post cash disbursements to accounts payable ledger when using accrual method.
5. Post cash disbursements to the general ledger.

UNIT XIV: Accounts Receivable

Competencies:
1. Record sales by preparing sales invoice.
2. Record sales in sales journal.
3. Post accounts receivables from sales journal.
4. Balance accounts receivables subsidiary to the general ledger and prepare aging analysis.

UNIT XV: Accounts Payable

Competencies:
1. Examine vendor invoices for clerical accuracy, pricing, and compare to receiving report.
2. Reconcile invoices to statements.
3. Record vendor invoices.
4. Code vendor invoices.
5. Post vendor invoices to accounts payable subsidiary.
6. Reconcile the accounts payable subsidiary to the general ledger.
7. Post vendor payments to the accounts payable subsidiary.

UNIT XVI: Payroll

Competencies:

1. Maintain list of employees, withholdings, pay rates, etc.
2. Accumulate and maintain employee wage records including hours worked, vacation, sick time, etc.
3. Calculate employee wages including proper withholdings.
4. Prepare payroll checks.
5. Balance payroll checks to payroll records.
6. Post payroll to cash disbursements journal.
7. Prepare simple payroll tax records.

UNIT XVII: Computerized Accounting

Competencies:

1. Perform practical applications in general ledger, cash receipts, cash disbursement, accounts receivable, accounts payable, and payroll using microcomputers.
2. Perform spreadsheet applications.
3. Perform data base applications.
4. Prepare backups.

UNIT XVIII: Job Seeking Skills

Competencies:

1. Perpare a personal resume.
2. Fill out a job application.
3. Prepare a letter of application.
4. Prepare a follow-up letter.
5. Participate in a mock job interview.
6. Identify proper resignation procedures.
7. Demonstrate familiarity with the following sources of job information: newspaper ads, job service, school placement, employment agencies, and personal contacts.
8. Evaluate and compare job opportunities to determine adequacy of the job to meet personal and financial need.
9. Make an appointment for a job interview.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Business (Data Processing)

Course Title: Computer Operator

CIP Code: 07.0302

Course Length 1350 Clock Hours - 12 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical shop experience to prepare students for employment or to provide supplemental training for persons previously or currently employed as computer operators.

The course prepares individuals to operate electronic data processing computers. It includes instruction in the review of program instructions, determination of procedures for a specific run, readying equipment for operation, manipulation and monitoring of controls during operation, troubleshooting, and on- and off-line operations.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The content is organized into competency-based units of instruction which specify occupational competencies which the student must successfully complete.

Units of Instruction:

I. Introduction to Data Processing
II. Interpersonal Communications Skills
III. English
IV. Math
V. Keyboarding
VI. Records Management
VII. Business Operations
VIII. Software Operations
IX. Hardware
X. Data Communications
XI. Microcomputer Operations
XII. Job Seeking Skills

Curriculum Competency Outline

UNIT I: Introduction to Data Processing

Competencies:

1. Develop an understanding of data processing terminology.
2. Identify career opportunities.
3. Describe working environment: (a) physical surroundings, (b) working conditions, and (c) human relations skills.
4. Describe the different functions of the computer in the work place.
5. Describe ethical and legal responsibilities of data processing professionals.
6. Identify safety hazards with respect to equipment and personnel.
7. Describe flow of data through computer data processing system.

UNIT II: Interpersonal Communications Skills

Competencies:

1. Develop a writing style fitted to the purpose of the message and adapted to the reader.
2. Follow written and verbal instructions.
3. Develop interactive telephone and direct communication skills.
4. Use appropriate vocabulary in communication skills.
5. Apply human relations skills.

UNIT III: English

Competencies:

1. Review fundamentals of English.
2. Identify parts of speech.
3. Demonstrate good sentence structure.
4. Demonstrate proficiency in the use of punctuation and capitalization.
5. Demonstrate proficiency in using reference materials.
6. Compose brief memos and short letters.
7. Acquire a working knowledge of the definitions of frequently-used and business-related words.

UNIT IV: Math

Competencies:

1. Review fundamentals of math.
2. Demonstrate proficiency in addition, subtraction, multiplication and division using fractions, decimals and percentages without the calculator.
3. Interpret, analyze, and solve word problems related to business situations.
4. Perform addition, subtraction, multiplication, and division with decimals on the calculator.

UNIT V: Keyboarding

Competencies:

1. Develop the ability to operate the electronic typewriter and/or microcomputer efficiently.
2. Demonstrate appropriate techniques for all key reaches.
3. Type simple letters, tables, and reports.
4. Develop adequate proofreading skills.
5. Type at a minimum rate of 25 wpm from straight copy for 3 minutes with 6 or fewer errors.

UNIT VI: Records Management

Competencies:

1. Demonstrate proficiency in the following basic filing procedures: (a) indexing, coding, cross referencing; (b) alphabetic; and (c) numerical.
2. Apply basic filing procedures to storage and retrieval of hard copy, diskettes, and tapes.

UNIT VII: Business Operations

Competencies:

1. Identify the needs of the various types of businesses such as retailing, manufacturing, financial, service, government, wholesaling, and distribution with respect to data processing.
2. Develop an understanding of business operations terminology.
3. Describe basic concepts of accounting.
4. Identify interrelationships between major phases of business activity such as marketing, purchasing, production, finance, information systems, personnel, and government vs. business.

UNIT VIII: Software Operations

Competencies:

1. Distinguish operating system software from application software.
2. Describe the working relationship between system and application software.
3. Utilize system's command language from interactive and batch modes to run systems utilities (back-up, sort, restore).
4. Utilize system's command language from interactive and batch modes to run batch job streams.
5. Use system's documentation and reference material.
6. Demonstrate ability to react to system's prompts and/or error conditions.
7. Identify security needs and procedures.
8. Define concepts of quality control.

UNIT IX: Hardware

Competencies:

Section A - Central Processing Unit (CPU)

1. Identify the three types of processors: microcomputer, minicomputer, and mainframe.
2. Describe the functions of the CPU.
3. Describe the applications of the microcomputer processor.
4. Describe the applications of the minicomputer processor.
5. Describe the applications of the mainframe processor.
6. Identify components and functions of processor unit.

Section B - Peripherals

1. Identify peripheral devices in a computer system.
2. Perform disc handling procedures including preventive maintenance.
3. Perform tape handling procedures including preventive maintenance.
4. Perform printer handling procedures including preventive maintenance.
5. Demonstrate the use of peripheral-related commands.
6. Demonstrate the use of a terminal in communicating with the system.

UNIT X: Data Communications

Competencies:

1. Identify hardware components and their functions.
2. Describe the various types of communications including digital vs. analog, synchronous vs. asynchronous, dial-up vs. direct line, and remote vs. local.
3. Describe the concept of networking.
4. Identify communication requirements for the microcomputer, minicomputer, and mainframe.

UNIT XI: Microcomputer Operations

Competencies:

1. Identify parts of a microcomputer system including hardware and software.
2. Demonstrate the use of the microcomputer with application program.
3. Use microcomputer to develop systems in the following: spread sheet, database, accounting applications, and inventory control.
4. Demonstrate proficiency in microcomputer peripheral handling procedures.
5. Perform backup procedures.
6. Identify microcomputer security needs and procedures.

UNIT XII: Job Seeking Skills

Competencies:

1. Prepare a personal resume'.
2. Fill out a job application.
3. Prepare a letter of application.
4. Prepare a follow-up letter.
5. Participate in a mock job interview.

6. Prepare a letter of resignation.
7. Demonstrate familiarity with the following sources of job information: newspaper ads, job service, school placement, employment agencies, and personal contacts.
8. Evaluate and compare job opportunities to determine adequacy of the job to meet personal and financial need.
9. Make an appointment for a job interview.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Business (Data Processing) **Course Title:** Computer Programmer

CIP Code: 07.0305 **Course Length** 2025 Clock Hours - 18 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical shop experience to prepare students for employment or to provide supplemental training for persons previously or currently employed as computer programmers.

The course prepares individuals to convert problems into detailed flow charts; code into computer language; test, monitor, debug, document, and maintain computer programs; and design programs for specific uses and machines.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The content is organized into competency-based units of instruction which specify occupational competencies which the student must successfully complete.

Units of Instruction:

I. Introduction to Data Processing
II. Interpersonal Communications Skills
III. English
IV. Math
V. Keyboarding
VI. Records Management
VII. Business Operations
VIII. Software Operations
IX. Hardware
X. Data Communications
XI. Microcomputer Operations
XII. Accounting
XIII. Introduction to Programming
XIV. Programming Languages
XV. Data Base Concepts
XVI. Comprehensive Project
XVII. Job Seeking Skills

Curriculum Competency Outline

UNIT I: Introduction to Data Processing

Competencies:

1. Develop an understanding of data processing terminology.
2. Identify career opportunities.
3. Describe working environment: (a) physical surroundings, (b) working conditions, and (c) human relations skills.
4. Describe the different functions of the computer in the work place.
5. Describe ethical and legal responsibilities of data processing professionals.
6. Identify safety hazards with respect to equipment and personnel.
7. Describe flow of data through computer data processing system.

UNIT II: Interpersonal Communications Skills

Competencies:

1. Develop a writing style fitted to the purpose of the message and adapted to the reader.
2. Follow written and verbal instructions.
3. Develop interactive telephone and direct communication skills.
4. Use appropriate vocabulary in communication skills.
5. Apply human relations skills.

UNIT III: English

Competencies:

1. Review fundamentals of English.
2. Identify parts of speech.
3. Demonstrate good sentence structure.
4. Demonstrate proficiency in the use of punctuation and capitalization.
5. Demonstrate proficiency in using reference materials.
6. Compose brief memos and short letters.
7. Acquire a working knowledge of the definitions of frequently-used and business-related words.

UNIT IV: Math

Competencies:

1. Review fundamentals of math.
2. Demonstrate proficiency in addition, subtraction, multiplication and division using fractions, decimals and percentages without the calculator.
3. Interpret, analyze, and solve word problems related to business situations.
4. Perform addition, subtraction, multiplication, and division with decimals on the calculator.

UNIT V: Keyboarding

Competencies:

1. Develop the ability to operate the electronic typewriter and/or microcomputer efficiently.
2. Demonstrate appropriate techniques for all key reaches.
3. Type simple letters, tables, and reports.
4. Develop adequate proofreading skills.
5. Type at a minimum rate of 25 wpm from straight copy for 5 minutes with 6 or fewer errors.

UNIT VI: Records Management

Competencies:

1. Demonstrate proficiency in the following basic filing procedures: (a) indexing, coding, cross referencing; (b) alphabetic; and (c) numerical.
2. Apply basic filing procedures to storage and retrieval of hard copy, diskettes, and tapes.

UNIT VII: Business Operations

Competencies:

1. Identify the needs of the various types of businesses such as retailing, manufacturing, financial, service, government, wholesaling, and distribution with respect to data processing.
2. Develop an understanding of business operations terminology.
3. Describe basic concepts of accounting.
4. Identify interrelationships between major phases of business activity such as marketing, purchasing, production, finance, information systems, personnel, and government vs. business.

UNIT VIII: Software Operations

Competencies:

1. Distinguish operating system software from application software.
2. Describe the working relationship between system and application software.
3. Utilize system's command language from interactive and batch modes to run systems utilities (back-up, sort, restore).
4. Utilize system's command language from interactive and batch modes to run batch job streams.
5. Use system's documentation and reference material.
6. Demonstrate ability to react to system's prompts and/or error conditions.
7. Identify security needs and procedures.
8. Define concepts of quality control.

UNIT IX: Hardware

Competencies:

Section A - Central Processing Unit (CPU)

1. Identify the three types of processors: microcomputer, minicomputer, and mainframe.
2. Describe the functions of the CPU.
3. Describe the applications of the microcomputer processor.
4. Describe the applications of the minicomputer processor.
5. Describe the applications of the mainframe processor.
6. Identify components and functions of processor unit.

Section B - Peripherals

1. Identify peripheral devices in a computer system.
2. Perform disc handling procedures including preventive maintenance.
3. Perform tape handling procedures including preventive maintenance.
4. Perform printer handling procedures including preventive maintenance.
5. Demonstrate the use of peripheral-related commands.
6. Demonstrate the use of a terminal in communicating with the system.

UNIT X: Data Communications

Competencies:

1. Identify hardware components and their functions.
2. Describe the various types of communications including digital vs. analog, synchronous vs. asynchronous, dial-up vs. direct line, and remote vs. local.
3. Describe the concept of networking.
4. Identify communication requirements for the microcomputer, minicomputer, and mainframe.

UNIT XI: Microcomputer Operations

Competencies:

1. Identify parts of a microcomputer system including hardware and software.
2. Demonstrate the use of the microcomputer with application program.
3. Use microcomputer to develop systems in the following: spread sheet, data base, accounting applications, and inventory control.
4. Demonstrate proficiency in microcomputer peripheral handling procedures.
5. Perform backup procedures.
6. Identify microcomputer security needs and procedures.

UNIT XII: Accounting

Competencies:

Section A - General

1. Demonstrate knowledge of accounting terminology.
2. Exhibit knowledge of the accounting cycle.
3. Identify various steps in the inventory cycle.
4. Describe various inventory systems.
5. Describe various methods of costing inventory.
6. Demonstrate a knowledge of the skill needed for effective collections.

Section B - General Ledger

1. Describe the functions of the general ledger.
2. Describe the account components of the general ledger.
3. Describe the relationship of the general ledger to the financial statements.
4. Reconcile bank cash balance to the general ledger cash balance.
5. Reconcile all other subsidiary ledgers to the general ledger.

Section C - Cash Receipts

1. Record cash receipts in a journal.
2. Prepare deposit.
3. Post cash receipts to accounts receivable ledger when using accrual method.
4. Post cash receipts to the general ledger.

Section D - Cash Disbursements

1. Write checks.
2. Record cash disbursements in a journal.
3. Code disbursements to the proper accounts.
4. Post cash disbursements to accounts payable ledger when using accrual method.
5. Post cash disbursements to the general ledger.

Section E - Accounts Receivable

1. Record sales by preparing sales invoice.
2. Record sales in sales journal.
3. Post accounts receivables from sales journal.
4. Balance accounts receivables subsidiary to the general ledger and prepare aging analysis.

Section F - Accounts Payable

1. Examine vendor invoices for clerical accuracy, pricing, and compare to receiving report.
2. Reconcile invoices to statements.
3. Record vendor invoices.
4. Code vendor invoices for account classification.
5. Post vendor invoices to accounts payable subsidiary.
6. Reconcile the accounts payable subsidiary to the general ledger.
7. Post vendor payments to the accounts payable subsidiary.

Section G - Payroll

1. Maintain list of employees, withholdings, pay rates, etc.
2. Accumulate and maintain employee wage records including hours worked, vacation, sick time, etc.
3. Calculate employee wages including proper withholdings.
4. Prepare payroll checks.
5. Balance payroll checks to payroll records.
6. Post payroll to cash disbursement journal.
7. Prepare simple payroll tax reports.

Section H - Computerized Accounting

1. Perform practical applications in general ledger, cash receipts, cash disbursements, accounts receivable, accounts payable, and payroll using microcomputers.
2. Perform spreadsheet applications.
3. Perform data base applications.
4. Prepare back-ups.

UNIT XIII: Introduction to Programming

Competencies:
1. Identify steps in the life cycle of a programming project.
2. Identify functions of binary, octal, and hexadecimal number systems.
3. Perform conversions and arithmetic operations of binary, octal, and hexadecimal number systems.
4. Use ANSI standard flowchart symbols to follow and create flowcharts.
5. Demonstrate ability to write and interpret pseudo-code.
6. Determine the logical sequence of a problem.

UNIT XIV: Programming Languages

Competencies:

Section A - BASIC Language

1. Demonstrate principles of structured programming.
2. Follow in-house programming guidelines and standards for format and technique.
3. Code the logic sequence from a flowchart or pseudo-code using the syntax of BASIC language.
4. Key program code using appropriate device.
5. Develop a comprehensive test plan for the program.
6. Test and debug the program.
7. Identify steps in making program available to end user including timeliness, documentation, training, and end user acceptance.

Section B - Advanced BASIC Language

1. Solve a complex problem using advanced BASIC syntax.
2. Solve a problem using table array concepts.
3. Use an existing subroutine to accomplish a specific purpose within the program.
4. Develop and use a subroutine.
5. Maintain an existing program including debug and modify.
6. Demonstrate ability to optimize memory and storage usage.

Section C - COBOL Language

1. Demonstrate principles of structured programming.
2. Follow in-house programming guidelines and standards for format and technique.
3. Code the logic sequence from a flowchart or pseudo-code using the syntax of COBOL language.
4. Key program code using appropriate device.
5. Develop a comprehensive test plan for the program.
6. Test and debug the program.
7. Identify steps in making program available to end user including timeliness, documentation, training, and end user acceptance.
8. Solve a complex problem using advanced COBOL syntax.
9. Solve a problem using table array concepts.
10. Use an existing subroutine to accomplish a specific purpose within the program.
11. Develop and use a subroutine.
12. Maintain an existing program including debug and modify.
13. Demonstrate ability to optimize memory and storage usage.

Section D - RPG Language

1. Demonstrate principles of structured programming.
2. Follow in-house programming guidelines and standards for format and technique.
3. Code the logic sequence from a flowchart or pseudo-code using the syntax of RPG language.
4. Key program code using appropriate device.
5. Develop a comprehensive test plan for the program.
6. Test and debug the program.
7. Identify steps in making program available to end user including timeliness, documentation, training, and end user acceptance.

8. Solve a complex problem using advanced RPG syntax.
9. Solve a problem using table/array concepts.
10. Use an existing subroutine to accomplish a specific purpose within the program.
11. Develop and use a subroutine.
12. Maintain an existing program including debug and modify.
13. Demonstrate ability to optimize memory and storage usage.

UNIT XV: Data Base Concepts

Competencies:

1. Identify the differences between a relational data base and a hierarchical data base.
2. Use and operate an existing data base.
3. Develop and/or modify a data base using command procedures.

UNIT XVI: Comprehensive Project

Competencies:

Section A - Systems Analysis

1. Communicate with user to establish a business need.
2. Analyze business need and make recommendations.
3. Develop detailed specifications for user approval.

Section B - Programming

1. Code programs according to detailed specifications in appropriate language.
2. Test and debug programs.

Section C - Making Programs Available to End User

1. Determine proper time to implement programs into the production environment.
2. Prepare appropriate documentation for internal data processing use, computer operations, and end user.
3. Provide training for computer operations and end user.
4. Obtain final end user acceptance.
5. Implement programs into the production environment.

UNIT XVII: Job Seeking Skills

Competencies:

1. Prepare a personal resume'.
2. Fill out a job application.
3. Prepare a letter of application.
4. Prepare a follow-up letter.
5. Participate in a mock job interview.
6. Prepare a letter of resignation.
7. Demonstrate familiarity with the following sources of job information: newspaper ads, job service, school placement, employment agencies, and personal contacts.
8. Evaluate and compare job opportunities to determine adequacy of the job to meet personal and financial need.
9. Make an appointment for a job interview.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education
Competency-Based Course Outline

Program Area: Business (Marketing) **Course Title:** Hospitality and Tourism

CIP Code: 08.0901 **Course Length** 225 Clock Hours - 2 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical experience to prepare students for employment in the hospitality and tourism industry or to provide supplemental training for persons previously or currently employed in the hospitality and tourism industry.

The course generally prepares individuals to perform marketing functions and tasks in any business enterprise primarily engaged in satisfying the desire of people to make productive or enjoyable use of leisure time. The course also prepares individuals to assume initiatives in any business, agency, or institution for attracting and serving the traveling public, with the objective of stimulating the local, state, or national economy.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The content is organized into competency-based units of instruction which specify occupational competencies which the student must successfully complete.

Units of Instruction: *CORE (80 Hours)*

I. Orientation to Hospitality and Tourism Industry
II. Introduction to the State
III. Employment Opportunities
IV. Employability Skills

Students will complete Core requirements and then select one or more of the following Specialty areas for completion of the program.

SPECIALTIES

I. Tour Guide (85 Hours)
II. Hotel Motel Operations (60 Hours)
III. Tour Planner Escort (145 Hours)
IV. Convention Planning and Services (60 Hours)
V. Travel Agency (90 Hours)
VI. Free Standing Food and Beverage Services (60 Hours)

Curriculum Competency Outline

UNIT I: Orientation to the Hospitality and Tourism Industry

Competencies:

1. Demonstrate a knowledge of the hospitality and tourism industry.
2. Describe the various occupations in the hospitality and tourism industry.
3. Demonstrate good attitudes and good work habits to include the following: self-discipline, self-motivation, appearance, and work ethics.
4. Describe professionalism as it applies to the hospitality and tourism industry.
5. Develop a self-profile to include strengths and weaknesses.
6. Take a personality self-rating test.

7. Demonstrate proper communication skills.
8. Identify the various service industries.
9. List the advantages and disadvantages of working in the hospitality and tourism industry.
10. Identify qualities needed for hospitality and tourism workers.

UNIT II: Introduction to the State

Competencies:
1. Identify different regions of the state.
2. Demonstrate a knowledge of the history of the state.
3. Demonstrate a knowledge of the geography of the state.
4. Demonstrate a knowledge of Louisiana state facts.
5. Develop competency in reading maps.

UNIT III: Employment Opportunities

Competencies:
1. Identify employment opportunities as tour guides.
2. Identify employment opportunities in hotel/motel operations.
3. Identify employment opportunities as tour planners/escorts.
4. Identify employment opportunities in convention services.
5. Identify employment opportunities in travel agencies.
6. Identify employment opportunities in free-standing food and beverage services.

UNIT IV: Employability Skills

Competencies:
1. Prepare a personal resume'.
2. Fill out a job application.
3. Prepare a letter of application.
4. Prepare a follow-up letter.
5. Participate in a mock job interview.
6. Make an appointment for a job interview.

SPECIALTY I: Tour Guide

Competencies:
1. Describe the characteristics of a tour guide.
2. Identify the duties of a tour guide.
3. Describe the importance of courtesy in the tourism industry.
4. Identify special problems and needs of visitors.
5. Identify methods of crowd control.
6. Identify unsafe areas for visitors.
7. Demonstrate a knowledge of first aid procedures.
8. Demonstrate a knowledge of the history and geography of the local area.
9. Develop a tour package.

SPECIALTY II: Hotel/Motel Operations

Competencies:
1. Describe procedures in maintaining rooms.
2. Describe food and beverage operations.
3. Describe sales and marketing operations.
4. Describe accounting operations.
5. Describe the organization of personnel within the various divisions of a hotel or motel and the areas of responsibility of each employee.

SPECIALTY III: Tour Planner/Escort

Competencies:
1. Describe the characteristics of a tour guide.
2. Identify the duties of a tour guide.
3. Describe the importance of courtesy in the tourism industry.

4. Identify special problems and needs of visitors.
5. Identify methods of crowd control.
6. Identify unsafe areas for visitors.
7. Demonstrate a knowledge of first aid procedures.
8. Demonstrate a knowledge of the history and geography of the local area.
9. Develop a tour package.
10. Describe procedures in maintaining rooms.
11. Describe food and beverage operations.
12. Describe sales and marketing operations.
13. Describe accounting operations.
14. Describe the organization of personnel within the various divisions of a hotel or motel and the areas of responsibility of each employee.

SPECIALTY IV: Convention Planning and Services

Competencies:

1. Develop working knowledge of terms and definitions in convention planning.
2. Demonstrate knowledge of facility arrangements.
3. Describe the various transportation services available.
4. Demonstrate knowledge of arranging meetings.
5. Determine food and beverage needs in convention planning.
6. Develop competency in planning excursions and out-of-hotel functions.
7. Develop a working knowledge of contracts.

SPECIALTY V: Travel Agency

Competencies:

1. Describe the computer's role in the travel agency.
2. Demonstrate proficiency in using the computer.
3. Demonstrate a knowledge of world geography.
4. Identify and use resources to obtain travel information.
5. Describe the various modes of transportation.
6. Determine appropriate mode of transportation to meet customer's needs.
7. Develop tour packages.

SPECIALTY VI: Free Standing Food and Beverage Services

Competencies:

1. Demonstrate a knowledge of the food and beverage service industry.
2. Demonstrate proficiency in cash register operations.
3. Describe the factors involved in good human relations.
4. Describe sanitation requirements and regulations.
5. Demonstrate a knowledge of legal requirements and regulations.
6. Identify and apply safety procedures.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education
Competency-Based Course Outline

Program Area: Business (Marketing) **Course Title:** Salesmanship

CIP Code: 08.0706 **Course Length** 675 Clock Hours - 6 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical experience to prepare students for employment in a variety of jobs in consumer products organizations or to provide supplemental training for persons previously or currently employed in consumer products organizations.

The course prepares individuals to apply marketing skills in a selling capacity in any industry, or to advance to more specialized training in marketing.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The content is organized into competency-based units of instruction which specify occupational competencies which the student must successfully complete.

Units of Instruction:
I. Introduction
II. Personal Development
III. Mathematics and the Cash Register
IV. Communications
V. Merchandise Presentation
VI. Personal Selling Skills
VII. Job Seeking Skills

Curriculum Competency Outline

UNIT I: Introduction

Competencies:
1. Identify types of consumer products organizations.
2. Identify and demonstrate abilities needed to secure employment in a consumer products organization.
3. Identify possible salaries and benefits in consumer products organizations.
4. Describe working conditions.

UNIT II: Personal Development

Competencies:
1. Perform self-evaluation.
2. Demonstrate professional attitudes and personality traits.
3. Observe, participate, and critique role-play activities.
4. Determine steps in personality development.
5. Describe the importance of human relations.
6. Develop an understanding of self and others.
7. Demonstrate honesty and integrity.
8. Demonstrate orderly and systematic behavior.
9. Demonstrate interest and enthusiasm.
10. Demonstrate initiative and creativity.

11. Describe the importance of first impressions.
12. Describe the importance of good personal health, dress, and grooming.
13. Demonstrate ability to accept criticism, maintain self-control, and adjust to change.

UNIT III: Mathematics and the Cash Register

Competencies:

1. Demonstrate proficiency in whole number computations.
2. Demonstrate proficiency in percentages decimals computations.
3. Demonstrate proficiency in fraction computations.
4. Make change with change indication.
5. Make change without change indication.
6. Demonstrate proficiency in preparing sales checks including: calculating amount of purchase; computing discounts, taxes, and special charges; and handling cash sales.
7. Demonstrate proficiency in recording sales tax.
8. Demonstrate proficiency in handling checks and charge sales.
9. Demonstrate proficiency in handling customer returns.
10. Identify functions of the electronic cash register.
11. Develop skills in the operation of the cash register.
12. Develop an understanding of the importance of accuracy in data entry.
13. Demonstrate proficiency in cash register check-out and department close-out.

UNIT IV: Communications

Competencies:

1. Review basic English skills.
2. Develop proper grammar.
3. Identify the importance of verbal communications.
4. Demonstrate proficiency in verbal communications.
5. Develop good listening skills.
6. Demonstrate ability to follow written and verbal instructions.
7. Develop telephone courtesy.

UNIT V: Merchandise Presentation

Competencies:

1. Describe the purpose of merchandise presentation.
2. Describe the effect of presentation on customers.
3. Identify presentation standards.
4. Demonstrate proficiency in constructing presentation including the following standards: color, harmony, balance, and proportion.
5. Demonstrate proficiency in presentation housekeeping.
6. Describe the importance of signing.
7. Demonstrate proficiency in dismantling presentation.

UNIT VI: Personal Selling Skills

Competencies:

1. Greet customer.
2. Determine customer needs and wants.
3. Demonstrate merchandise knowledge.
4. Present merchandise to customer.
5. Demonstrate ability to answer questions and overcome objections.
6. Demonstrate ability to close sale.
7. Recognize and respond to customer preference during merchandise presentation.
8. Demonstrate proficiency in suggestion selling.
9. Demonstrate proficiency in telephone selling.
10. Demonstrate proficiency in handling customer complaints.

UNIT VII: Job Seeking Skills

Competencies:
1. Prepare a personal resume.
2. Fill out a job application.
3. Prepare a letter of application.
4. Prepare a follow-up letter.
5. Participate in a mock job interview.
6. Identify proper resignation procedures.
7. Demonstrate familiarity with the following sources of job information: newspaper ads, job service, school placement, employment agencies, and personal contacts.
8. Evaluate and compare job opportunities to determine adequacy of the job to meet personal and financial need.
9. Make an appointment for a job interview.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Business (Office Occupations)

Course Title: Secretary

CIP Code: 07.0606

Course Length 1463 Clock Hours - 13 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical experience to prepare students for employment as secretaries or to provide supplemental training for persons previously or currently employed as secretaries.

This course prepares individuals to carry out administrative and general office duties in a support capacity. It includes instruction in scheduling appointments, giving information to callers, taking and transcribing dictation, and relieving officials of minor administrative and business details.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The content is organized into competency-based units of instruction which specify occupational competencies which the student must successfully complete.

The course is organized so that a student may complete Units I through XIII, XVII, and XVIII and exit the course with certification as a secretary without shorthand.

Units of Instruction:

I. English
II. Math
III. Vocabulary
IV. Introduction to Computers
V. Personal Development and Human Relations
VI. Keyboarding
VII. Recordkeeping
VIII. Office Procedures
IX. Filing
X. Business Correspondence
XI. Typing
XII. Word Processing
XIII. Machine Transcription
XIV. Shorthand
XV. Legal Shorthand (Optional)
XVI. Medical Shorthand (Optional)
XVII. Advanced Office Procedures
XVIII. Job Seeking Skills

Curriculum Competency Outline

UNIT I: English

Competencies:

1. Review fundamentals of English.
2. Identify parts of speech.
3. Demonstrate good sentence structure.
4. Demonstrate proficiency in the use of punctuation and capitalization.
5. Demonstrate proficiency in using reference materials.
6. Compose brief memos and short letters.

UNIT II: Math

Competencies:

1. Review fundamentals of math.
2. Demonstrate proficiency in addition, subtraction, multiplication and division using fractions, decimals, and percentages without the calculator.
3. Interpret, analyze, and solve word problems related to business situations.
4. Perform addition, subtraction, multiplication, and division with decimals on the calculator using the touch system.
5. Demonstrate a working knowledge of these four math functions in the following applications: discounts and net amounts; markup and markdown; prorating; interest, notes, and discounts; and payroll.

UNIT III: Vocabulary

Competencies:

1. Apply the correct spelling, pronunciation and syllabication of frequently used and business related words.
2. Use appropriate vocabulary in communication skills.
3. Select the best word from synonyms, antonyms, and homonyms.
4. Learn and apply rules for plurals, possessives, prefixes, suffixes, and word endings.
5. Demonstrate proficiency in the use of a dictionary.
6. Acquire a working knowledge of the definitions of frequently used and business related words.

UNIT IV: Introduction to Computers

Competencies:

1. Learn basic microcomputer terminology.
2. Describe and identify the functions of microcomputers.
3. Understand the use of the function keys.
4. Demonstrate the proper power-up and power-down sequence as well as perform simple tasks related to word processing, data base, spread sheet, and graphics programs.
5. Save and print documents.

UNIT V: Personal Development and Human Relations

Competencies:

1. Perform self-evaluation to determine strengths and weaknesses.
2. Develop good grooming and personal hygiene.
3. Demonstrate ability to follow written and verbal instructions.
4. Develop a healthy self-esteem.
5. Describe importance of the following professional qualities when given various office situations: honesty, loyalty, courtesy, cooperation, alertness, ambition, punctuality, interest, involvement, patience, tact, confidence, sense of humor, dependability, reliability, flexibility, and initiative.
6. Demonstrate the following proper telephone techniques:
    - Answers the telephone
    - Places local and long-distance calls
    - Screens telephone calls
    - Transfers or refers telephone calls
    - Records messages
    - Maintains records of long-distance calls
    - Uses various directories
    - Operates intercom system
    - Operates paging system
    - Operates multiline system
7. Demonstrate the following proper telephone etiquette: courtesy, voice control, diction, expression, vocabulary, and discretion.

8. Describe acceptable conduct in the following personal relationships: employee-employer, employee-coworker, and employee-public.

UNIT VI: Keyboarding

Competencies:

1. Develop the ability to operate the electronic typewriter and/or microcomputer efficiently.
2. Demonstrate appropriate techniques for all key reaches.
3. Type simple letters, tables, and reports.
4. Develop adequate proofreading skills.
5. Type at a minimum rate of 25 wpm from straight copy for 3 minutes with 6 or fewer errors.
6. Make corrections using typing eraser, correction tapes, and correction fluids.

UNIT VII: Recordkeeping

Competencies:

1. Identify and complete business related forms.
2. Demonstrate ability to maintain efficient records, manually or electronically, for cashiers, banking, petty cash, students and families, retail sales clerks, a purchasing department, wholesale sales department, payroll department, and small retail business and other related records.
3. Demonstrate proficiency in penmanship.

UNIT VIII: Office Procedures

Competencies:

1. Understand and demonstrate the following procedures for handling incoming mail:
    A. Opens and stamps mail for date time
    B. Sorts mail for distribution
    C. Maintains current routing guide distribution lists
2. Understand and demonstrate the following procedures for handling outgoing mail:
    A. Stamps and seals envelopes
    B. Uses postage scales and U.S. Postal manuals
    C. Calculates postage rates and purchases postage
    D. Operates postage meter
3. Describe the various procedures for shipping materials.
4. Describe on-the-job situations where safety-consciousness must be demonstrated.
5. Practice safety in all jobs.
6. Demonstrate proper fire prevention techniques to be used at the job site.
7. Demonstrate ability to use copy machine.
8. Assemble, collate, and staple duplicated material.
9. Exhibit an awareness of office supplies, their uses and sources.
10. Recognize the importance of confidentiality and privacy laws.
11. Understand the value and importance of the following machines in business: calculator, typewriter, copy machine, transcribing machine, postage machine, microcomputer, telephone, and others.
12. Learn and apply rules for alphabetic indexing.
13. Learn and apply rules for numeric indexing.

UNIT IX: Filing

Competencies:

1. Demonstrate proper filing procedure including collecting material to be filed, inspecting for time stamp release mark, indexing, coding, cross-referencing, sorting, placing cards in file and arranging records in file.
2. Learn and apply rules for subject and geographical filing.
3. Understand the criteria by which records are created, stored, retrieved, retained, and disposed of.

4. Demonstrate proper procedures for the operation and control of manual and electronic storage systesm.
5. Learn and apply rules for medical and legal records and management.
6. Identify procedures to establish file systems.
7. Describe the following filing equipment: vertical file, lateral/shelf file, folders, guides, labels, sorters, and staplers.
8. Describe the following special filing systems: card files (visible index, rotary wheel, tickler, and vertical), microfilm, microfiche, and elevator file.

UNIT X: Business Correspondence

Competencies:
1. Compose and type all types of business letters and other written communication.
2. Proofread and edit typewritten and handwritten material and evaluate its acceptability as a finished piece.

UNIT XI: Typing

Competencies:
1. Prepare usable copy by making neat erasures and by crowding and spreading letters.
2. Make typed corrections on typewritten materials that have been removed from typewriter.
3. Establish the standard of mailability for all production work.
4. Learn to arrange material attractively.
5. Center material vertically and horizontally on paper of any size.
6. Type from rough draft and handwritten letters, reports, and statistical materials.
7. Prepare carbon copy.
8. Type letters, tables, and reports of varying levels of difficulty using electronic typewriters or microcomputers.
9. Type different letter styles applying rules of mixed and open punctuation.
10. Demonstrate knowledge of special parts of letters.
11. Type envelopes using the latest address styles recommended by postal officials.
12. Type letters using various sizes of stationery and letterheads.
13. Apply rules for second page heading styles.
14. Type business forms and statistical communications.
15. Type interoffice memorandum with tables, headings, and correct margins using printed and unprinted forms.
16. Type advanced legal, medical, technical, and governmental documents.
17. Type at a minimum of 50 words per minute from straight copy for five minutes with five or fewer errors.

UNIT XII: Word Processing

Competencies:
1. Understand basic word processing concepts and terminology.
2. Demonstrate proficiency in inputting letters and manuscripts.
3. Demonstrate proficiency in inputting documents containing columns, tables, and charts.
4. Demonstrate proficiency in advanced editing including highlighting, search and replace, cut and paste/block and move, rulers, headers and footers, formatting, paginating, proofreading, etc.
5. Demonstrate proficiency in advanced list processing/mailmerge.
6. Save and print documents using various print options.
7. Demonstrate proficiency in the use of various software and hardware manuals.
8. Perform practical applications and set up documents from rough-draft materials.
9. Identify and describe the procedures involved in the use of electronic mail.
10. Identify and describe some of the various word processing software packages on the market.
11. Perform spreadsheet applications.
12. Perform data base applications.

UNIT XIII: Machine Transcription

Competencies:
1. Become proficient in the operation of the transcription equipment.
2. Transcribe documents, including legal and medical materials, from the transcription machine.

UNIT XIV: Shorthand

Competencies:
1. Read and write shorthand outlines and learn shorthand theory, brief forms, and phrases.
2. Take familiar and unfamiliar dictation at various speeds.
3. Read and write shorthand rapidly and accurately in the shortest possible time.
4. Construct outlines for unfamiliar words under the stress of dictation.
5. Increase dictation speed to the highest point possible.
6. Take dictation on unfamiliar material at each speed from 40 to 80 words per minute for 3 minutes and produce typewritten transcriptions with 95% accuracy.
7. Take dictation on unfamiliar material at a minimum rate of 80 words per minute for 3 minutes and produce typewritten transcriptions with 95% accuracy.
8. Take dictation on unfamiliar material at a minimum rate of 80 words per minute for 3 minutes and produce typewritten transcription in mailable form.

UNIT XV: Legal Shorthand (Optional) - 135 Hours

Competencies:
1. Develop a working knowledge of legal correspondence and professional records.
2. Master the specialized legal vocabulary while taking familiar and unfamiliar dictation at various speeds.
3. Take dictation on unfamiliar legal material at a minimum rate of 80 words per minute for 3 minutes and produce typewritten transcription in mailable form.

UNIT XVI: Medical Shorthand (Optional) - 135 Hours

Competencies:
1. Develop a working knowledge of medical correspondence and professional records.
2. Master the specialized medical vocabulary while taking familiar and unfamiliar dictation at various speeds.
3. Take dictation on unfamiliar medical material at a minimum rate of 80 words per minute for 3 minutes and produce typewritten transcription in mailable form.

UNIT XVII: Advanced Office Procedures

Competencies:
1. Organize meetings including recording and disseminating minutes.
2. Maintain employer's appointment calendar.
3. Maintain a tickler file.
4. Outline the details of preparation of a business trip including: destination, dates, available departure/arrival times, types of hotel/car rental reservations needed, and other related details.
5. Prepare a trip folder to include: tickets and hotel reservations; itinerary; letters, memos, and copies of correspondence; reports, programs, and other necessary papers; copy of speech or speech notes; reminders of confirmed appointments; telephone numbers and addresses; and special instruction not included in itinerary.
6. Maintain classified and confidential files.
7. Maintain an adequate supplies inventory.
8. Recognize the importance of discretion and tact.
9. Screen telephone and office callers.

UNIT XVIII: Job Seeking Skills

Competencies:

1. Perpare a personal resume.
2. Fill out a job application.
3. Prepare a letter of application.
4. Prepare a follow-up letter.
5. Participate in a mock job interview.
6. Prepare a letter of resignation.
7. Demonstrate familiarity with the following sources of job information: newspaper ads, job service, school placement, employment agencies, and personal contacts.
8. Evaluate and compare job opportunities to determine adequacy of the job to meet personal and financial need.
9. Make an appointment for a job interview.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education
Competency-Based Course Outline

Program Area: Business (Office Occupations)
Course Title: Stenographer

CIP Code: 07.0607
Course Length 1350 Clock Hours - 12 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical experience to prepare students for employment as stenographers or to provide supplemental training for persons previously or currently employed as stenographers.

The course prepares individuals to take dictation of correspondence, reports, and other materials, by hand or machine and to transcribe dictated materials.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The content is organized into competency-based units of instruction which specify occupational competencies which the student must successfully complete.

There are two optional units of instruction, Legal Shorthand and Medical Shorthand, that are provided to allow students the opportunity to specialize in one or both of these areas.

Units of Instruction:

I. English
II. Math
III. Vocabulary
IV. Introduction to Computers
V. Personal Development and Human Relations
VI. Keyboarding
VII. Recordkeeping
VIII. Office Procedures
IX. Filing
X. Business Correspondence
XI. Typing
XII. Word Processing
XIII. Machine Transcription
XIV. Shorthand
XV. Legal Shorthand (Optional)
XVI. Medical Shorthand (Optional)
XVII. Job Seeking Skills

Curriculum Competency Outline

UNIT I: English

Competencies:

1. Review fundamentals of English.
2. Identify parts of speech.
3. Demonstrate good sentence structure.
4. Demonstrate proficiency in the use of punctuation and capitalization.
5. Demonstrate proficiency in using reference materials.
6. Compose brief memos and short letters.

UNIT II: Math

Competencies:

1. Review fundamentals of math.
2. Demonstrate proficiency in addition, subtraction, multiplication and division using fractions, decimals, and percentages without the calculator.
3. Interpret, analyze, and solve word problems related to business situations.
4. Perform addition, subtraction, multiplication, and division with decimals on the calculator using the touch system.
5. Demonstrate a working knowledge of these four math functions in the following applications: discounts and net amounts; markup and markdown; prorating; interest, notes, and discounts; and payroll.

UNIT III: Vocabulary

Competencies:

1. Apply the correct spelling, pronunciation and syllabication of frequently used and business related words.
2. Use appropriate vocabulary in communication skills.
3. Select the best word from synonyms, antonyms, and homonyms.
4. Learn and apply rules for plurals, possessives, prefixes, suffixes, and word endings.
5. Demonstrate proficiency in the use of a dictionary.
6. Acquire a working knowledge of the definitions of frequently used and business related words.

UNIT IV: Introduction to Computers

Competencies:

1. Learn basic microcomputer terminology.
2. Describe and identify the functions of microcomputers.
3. Understand the use of the function keys.
4. Demonstrate the proper power-up and power-down sequence as well as perform simple tasks related to word processing, data base, spread sheet, and graphics programs.
5. Save and print documents.

UNIT V: Personal Development and Human Relations

Competencies:

1. Perform self-evaluation to determine strengths and weaknesses.
2. Develop good grooming and personal hygiene.
3. Demonstrate ability to follow written and verbal instructions.
4. Develop a healthy self-esteem.
5. Describe importance of the following professional qualities when given various office situations: honesty, loyalty, courtesy, cooperation, alertness, ambition, punctuality, interest, involvement, patience, tact, confidence, sense of humor, dependability/reliability, flexibility, and initiative.
6. Demonstrate the following proper telephone techniques:
    Answers the telephone
    Places local and long-distance calls
    Screens telephone calls
    Transfers or refers telephone calls
    Records messages
    Maintains records of long-distance calls
    Uses various directories
    Operates intercom system
    Operates paging system
    Operates multiline system
7. Demonstrate the following proper telephone etiquette: courtesy, voice control, diction, expression, vocabulary, and discretion.

8. Describe acceptable conduct in the following personal relationships: employee-employer, employee-coworker, and employee-public.

UNIT VI: Keyboarding

Competencies:

1. Develop the ability to operate the electronic typewriter and/or microcomputer efficiently.
2. Demonstrate appropriate techniques for all key reaches.
3. Type simple letters, tables, and reports.
4. Develop adequate proofreading skills.
5. Type at a minimum rate of 25 wpm from straight copy for 3 minutes with 6 or fewer errors.
6. Make corrections using typing eraser, correction tapes, and correction fluids.

UNIT VII: Recordkeeping

Competencies:

1. Identify and complete business related forms.
2. Demonstrate ability to maintain efficient records, manually or electronically, for cashiers, banking, petty cash, students and families, retail sales clerks, a purchasing department, wholesale sales department, payroll department, and small retail business and other related records.
3. Demonstrate proficiency in penmanship.

UNIT VIII: Office Procedures

Competencies:

1. Understand and demonstrate the following procedures for handling incoming mail:
   A. Opens and stamps mail for date/time
   B. Sorts mail for distribution
   C. Maintains current routing guide/distribution lists
2. Understand and demonstrate the following procedures for handling outgoing mail:
   A. Stamps and seals envelopes
   B. Uses postage scales and U.S. Postal manuals
   C. Calculates postage rates and purchases postage
   D. Operates postage meter
3. Describe the various procedures for shipping materials.
4. Describe on-the-job situations where safety-consciousness must be demonstrated.
5. Practice safety in all jobs.
6. Demonstrate proper fire prevention techniques to be used at the job site.
7. Demonstrate ability to use copy machine.
8. Assemble, collate, and staple duplicated material.
9. Exhibit an awareness of office supplies, their uses and sources.
10. Recognize the importance of confidentiality and privacy laws.
11. Understand the value and importance of the following machines in business: calculator, typewriter, copy machine, transcribing machine, postage machine, microcomputer, telephone, and others.
12. Learn and apply rules for alphabetic indexing.
13. Learn and apply rules for numeric indexing.

UNIT IX: Filing

Competencies:

1. Demonstrate proper filing procedure including collecting material to be filed, inspecting for time stamp/release mark, indexing, coding, cross-referencing, sorting, placing cards in file and arranging records in file.
2. Learn and apply rules for subject and geographical filing.
3. Understand the criteria by which records are created, stored, retrieved, retained, and disposed of.

4. Demonstrate proper procedures for the operation and control of manual and electronic storage systesm.
5. Learn and apply rules for medical and legal records and management.
6. Identify procedures to establish file systems.
7. Describe the following filing equipment: vertical file, lateral/shelf file, folders, guides, labels, sorters, and staplers.
8. Describe the following special filing systems: card files (visible index, rotary wheel, tickler, and vertical), microfilm, microfiche, and elevator file.

UNIT X: Business Correspondence

Competencies:

1. Compose and type all types of business letters and other written communication.
2. Proofread and edit typewritten and handwritten material and evaluate its acceptability as a finished piece.

UNIT XI: Typing

Competencies:

1. Prepare usable copy by making neat erasures and by crowding and spreading letters.
2. Make typed corrections on typewritten materials that have been removed from typewriter.
3. Establish the standard of mailability for all production work.
4. Learn to arrange material attractively.
5. Center material vertically and horizontally on paper of any size.
6. Type from rough draft and handwritten letters, reports, and statistical materials.
7. Prepare carbon copy.
8. Type letters, tables, and reports of varying levels of difficulty using electronic typewriters or microcomputers.
9. Type different letter styles applying rules of mixed and open punctuation.
10. Demonstrate knowledge of special parts of letters.
11. Type envelopes using the latest address styles recommended by postal officials.
12. Type letters using various sizes of stationery and letterheads.
13. Apply rules for second page heading styles.
14. Type business forms and statistical communications.
15. Type interoffice memorandum with tables, headings, and correct margins using printed and unprinted forms.
16. Type advanced legal, medical, technical, and governmental documents.
17. Type at a minimum of 50 words per minute from straight copy for five minutes with five or fewer errors.

UNIT XII: Word Processing

Competencies:

1. Understand basic word processing concepts and terminology.
2. Demonstrate proficiency in inputting letters and manuscripts.
3. Demonstrate proficiency in inputting documents containing columns, tables, and charts.
4. Demonstrate proficiency in advanced editing including highlighting, search and replace, cut and paste/block and move, rulers, headers and footers, formatting, paginating, proofreading, etc.
5. Demonstrate proficiency in advanced list processing/mailmerge.
6. Save and print documents using various print options.
7. Demonstrate proficiency in the use of various software and hardware manuals.
8. Perform practical applications and set up documents from rough-draft materials.
9. Identify and describe the procedures involved in the use of electronic mail.
10. Identify and describe some of the various word processing software packages on the market.
11. Perform spreadsheet applications.
12. Perform data base applications.

UNIT XIII: Machine Transcription

Competencies:
1. Become proficient in the operation of the transcription equipment.
2. Transcribe documents, including legal and medical materials, from the transcription machine.

UNIT XIV: Shorthand

Competencies:
1. Read and write shorthand outlines and learn shorthand theory, brief forms, and phrases.
2. Take familiar and unfamiliar dictation at various speeds.
3. Read and write shorthand rapidly and accurately in the shortest possible time.
4. Construct outlines for unfamiliar words under the stress of dictation.
5. Increase dictation speed to the highest point possible.
6. Take dictation on unfamiliar material at each speed from 40 to 80 words per minute for 3 minutes and produce typewritten transcriptions with 95% accuracy.
7. Take dictation on unfamiliar material at a minimum rate of 80 words per minute for 3 minutes and produce typewritten transcriptions with 95% accuracy.
8. Take dictation on unfamiliar material at a minimum rate of 80 words per minute for 3 minutes and produce typewritten transcription in mailable form.

UNIT XV: Legal Shorthand (Optional) - 135 Hours

Competencies:
1. Develop a working knowledge of legal correspondence and professional records.
2. Master the specialized legal vocabulary while taking familiar and unfamiliar dictation at various speeds.
3. Take dictation on unfamiliar legal material at a minimum rate of 80 words per minute for 3 minutes and produce typewritten transcription in mailable form.

UNIT XVI: Medical Shorthand (Optional) - 135 Hours

Competencies:
1. Develop a working knowledge of medical correspondence and professional records.
2. Master the specialized medical vocabulary while taking familiar and unfamiliar dictation at various speeds.
3. Take dictation on unfamiliar medical material at a minimum rate of 80 words per minute for 3 minutes and produce typewritten transcription in mailable form.

UNIT XVII: Job Seeking Skills

Competencies:
1. Perpare a personal resume.
2. Fill out a job application.
3. Prepare a letter of application.
4. Prepare a follow-up letter.
5. Participate in a mock job interview.
6. Identify proper resignation procedures.
7. Demonstrate familiarity with the following sources of job information: newspaper ads, job service, school placement, employment agencies, and personal contacts.
8. Evaluate and compare job opportunities to determine adequacy of the job to meet personal and financial need.
9. Make an appointment for a job interview.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Business (Data Processing) **Course Title:** Terminal System Operator

CIP Code: 07.0303 **Course Length** 1013 Clock Hours - 9 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical shop experience to prepare students for employment or to provide supplemental training for persons previously or currently employed as computer operators.

The course prepares individuals to operate key entry devices to convert source documents to machine input media for electronic data processing; to verify and correct data; and to monitor equipment during operation.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The content is organized into competency-based units of instruction which specify occupational competencies which the student must successfully complete.

Units of Instruction:

I. Introduction to Data Processing
II. Interpersonal Communications Skills
III. English
IV. Math
V. Keyboarding
VI. Records Management
VII. Business Operations
VIII. Software Operations
IX. Microcomputer Operations
X. Comprehensive Keyboarding Project
XI. Job Seeking Skills

Curriculum Competency Outline

UNIT I: Introduction to Data Processing

Competencies:

1. Develop an understanding of data processing terminology.
2. Identify career opportunities.
3. Describe working environment: (a) physical surroundings, (b) working conditions, and (c) human relations skills.
4. Describe the different functions of the computer in the work place.
5. Describe ethical and legal responsibilities of data processing professionals.
6. Identify safety hazards with respect to equipment and personnel.
7. Describe flow of data through computer data processing system.

UNIT II: Interpersonal Communications Skills

Competencies:
1. Develop a writing style fitted to the purpose of the message and adapted to the reader.
2. Follow written and verbal instructions.
3. Develop interactive telephone and direct communication skills.
4. Use appropriate vocabulary in communication skills.
5. Apply human relations skills.

UNIT III: English

Competencies:
1. Review fundamentals of English.
2. Identify parts of speech.
3. Demonstrate good sentence structure.
4. Demonstrate proficiency in the use of punctuation and capitalization.
5. Demonstrate proficiency in using reference materials.
6. Compose brief memos and short letters.
7. Acquire a working knowledge of the definitions of frequently-used and business-related words.

UNIT IV: Math

Competencies:
1. Review fundamentals of math.
2. Demonstrate proficiency in addition, subtraction, multiplication and division using fractions, decimals and percentages without the calculator.
3. Interpret, analyze, and solve word problems related to business situations.
4. Perform addition, subtraction, multiplication, and division with decimals on the calculator.

UNIT V: Keyboarding

Competencies:
1. Develop the ability to operate the electronic typewriter and/or microcomputer efficiently.
2. Demonstrate appropriate techniques for all key reaches.
3. Type simple letters, tables, and reports.
4. Develop adequate proofreading skills.
5. Type at a minimum rate of 25 wpm from straight copy for 3 minutes with 6 or fewer errors.

UNIT VI: Records Management

Competencies:
1. Demonstrate proficiency in the following basic filing procedures: (a) indexing, coding, cross referencing; (b) alphabetic; and (c) numerical.
2. Apply basic filing procedures to storage and retrieval of hard copy, diskettes, and tapes.

UNIT VII: Business Operations

Competencies:
1. Identify the needs of the various types of businesses such as retailing, manufacturing, financial, service, government, wholesaling, and distribution with respect to data processing.
2. Develop an understanding of business operations terminology.
3. Describe basic concepts of accounting.
4. Identify interrelationships between major phases of business activity such as marketing, purchasing, production, finance, information systems, personnel, and government vs. business.

UNIT VIII: Software Operations

Competencies:

1. Distinguish operating system software from application software.
2. Describe the working relationship between system and application software.
3. Utilize system's command language from interactive and batch modes to run systems utilities (back-up, sort, restore).
4. Utilize system's command language from interactive and batch modes to run batch job streams.
5. Use system's documentation and reference material.
6. Demonstrate ability to react to system's prompts and/or error conditions.
7. Identify security needs and procedures.
8. Define concepts of quality control.

UNIT IX: Microcomputer Operations

Competencies:

1. Identify parts of a microcomputer system including hardware and software.
2. Demonstrate the use of the microcomputer with application program.
3. Use microcomputer to develop systems in the following: spread sheet, database, accounting applications, and inventory control.
4. Demonstrate proficiency in microcomputer peripheral handling procedures.
5. Perform backup procedures.
6. Identify microcomputer security needs and procedures.

UNIT X: Comprehensive Keyboarding Project

Competencies:

1. Perform keying ability in business applications such as payroll, inventory, and invoices.
2. Type at a minimum rate of 40 wpm from straight copy for 5 minutes with 3 or fewer errors.

UNIT XI: Job Seeking Skills

Competencies:

1. Prepare a personal resume'.
2. Fill out a job application.
3. Prepare a letter of application.
4. Prepare a follow-up letter.
5. Participate in a mock job interview.
6. Prepare a letter of resignation.
7. Demonstrate familiarity with the following sources of job information: newspaper ads, job service, school placement, employment agencies, and personal contacts.
8. Evaluate and compare job opportunities to determine adequacy of the job to meet personal and financial need.
9. Make an appointment for a job interview.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Business (Office Occupations) **Course Title:** Word Processor Operator

CIP Code: 07.0608 **Course Length** 1013 Clock Hours - 9 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical experience to prepare students for employment as clerk-typists/word processor operators or to provide supplemental training for persons previously or currently employed as clerk-typists/word processor operators.

This course prepares individuals to use a typewriter in a variety of activities, including correspondence and compiling and typing reports, application forms, shipping tickets, and other data from clerical records. It also prepares individuals to edit and produce written communications utilizing special-purpose machines to correct, format, and print information. It includes instruction in filing records and reports, posting information to records, sorting and distributing mail, answering telephones, and computing with calculating machines.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The content is organized into competency-based units of instruction which specify occupational competencies which the student must successfully complete.

The course is organized so that students may exit as a Receptionist after completing Units I-VIII, as a Records Control Clerk after completing Units I-IX, and as a Clerk-Typist after completing Units I-XII. All students must complete Unit XIV.

Units of Instruction:

I. English
II. Math
III. Vocabulary
IV. Introduction to Computers
V. Personal Development and Human Relations
VI. Keyboarding
VII. Recordkeeping
VIII. Office Procedures
EXIT POINT: Receptionist (CIP Code: 07.0707)
IX. Filing
EXIT POINT: Records Control Clerk (CIP Code: 07.9999)
X. Business Correspondence
XI. Typing
XII. Machine Transcription
EXIT POINT: Clerk-Typist (CIP Code: 07.0702)
XIII. Word Processing
XIV. Job Seeking Skills

Curriculum Competency Outline

UNIT I: English

Competencies:

1. Review fundamentals of English.
2. Identify parts of speech.
3. Demonstrate good sentence structure.
4. Demonstrate proficiency in the use of punctuation and capitalization.
5. Demonstrate proficiency in using reference materials.
6. Compose brief memos and short letters.

UNIT II: Math

Competencies:

1. Review fundamentals of math.
2. Demonstrate proficiency in addition, subtraction, multiplication and division using fractions, decimals, and percentages without the calculator.
3. Interpret, analyze, and solve word problems related to business situations.
4. Perform addition, subtraction, multiplication, and division with decimals on the calculator using the touch system.
5. Demonstrate a working knowledge of these four math functions in the following applications: discounts and net amounts; markup and markdown; prorating; interest, notes, and discounts; and payroll.

UNIT III: Vocabulary

Competencies:

1. Apply the correct spelling, pronunciation and syllabication of frequently used and business related words.
2. Use appropriate vocabulary in communication skills.
3. Select the best word from synonyms, antonyms, and homonyms.
4. Learn and apply rules for plurals, possessives, prefixes, suffixes, and word endings.
5. Demonstrate proficiency in the use of a dictionary.
6. Acquire a working knowledge of the definitions of frequently used and business related words.

UNIT IV: Introduction to Computers

Competencies:

1. Learn basic microcomputer terminology.
2. Describe and identify the functions of microcomputers.
3. Understand the use of the function keys.
4. Demonstrate the proper power-up and power-down sequence as well as perform simple tasks related to word processing, data base, spread sheet, and graphics programs.
5. Save and print documents.

UNIT V: Personal Development and Human Relations

Competencies:

1. Perform self-evaluation to determine strengths and weaknesses.
2. Develop good grooming and personal hygiene.
3. Demonstrate ability to follow written and verbal instructions.
4. Develop a healthy self-esteem.
5. Describe importance of the following professional qualities when given various office situations: honesty, loyalty, courtesy, cooperation, alertness, ambition, punctuality, interest, involvement, patience, tact, confidence, sense of humor, dependability/reliability, flexibility, and initiative.
6. Demonstrate the following proper telephone techniques:
    - Answers the telephone
    - Places local and long-distance calls
    - Screens telephone calls
    - Transfers or refers telephone calls
    - Records messages
    - Maintains records of long-distance calls
    - Uses various directories
    - Operates intercom system
    - Operates paging system
    - Operates multiline system
7. Demonstrate the following proper telephone etiquette: courtesy, voice control, diction, expression, vocabulary, and discretion.

8. Describe acceptable conduct in the following personal relationships: employee-employer, employee-coworker, and employee-public.

UNIT VI: Keyboarding

Competencies:

1. Develop the ability to operate the electronic typewriter and/or microcomputer efficiently.
2. Demonstrate appropriate techniques for all key reaches.
3. Type simple letters, tables, and reports.
4. Develop adequate proofreading skills.
5. Type at a minimum rate of 25 wpm from straight copy for 3 minutes with 6 or fewer errors.
6. Make corrections using typing eraser, correction tapes, and correction fluids.

UNIT VII: Recordkeeping

Competencies:

1. Identify and complete business related forms.
2. Demonstrate ability to maintain efficient records, manually or electronically, for cashiers, banking, petty cash, students and families, retail sales clerks, a purchasing department, wholesale sales department, payroll department, and small retail business and other related records.
3. Demonstrate proficiency in penmanship.

UNIT VIII: Office Procedures

Competencies:

1. Understand and demonstrate the following procedures for handling incoming mail:
    A. Opens and stamps mail for date/time
    B. Sorts mail for distribution
    C. Maintains current routing guide/distribution lists
2. Understand and demonstrate the following procedures for handling outgoing mail:
    A. Stamps and seals envelopes
    B. Uses postage scales and U.S. Postal manuals
    C. Calculates postage rates and purchases postage
    D. Operates postage meter
3. Describe the various procedures for shipping materials.
4. Describe on-the-job situations where safety-consciousness must be demonstrated.
5. Practice safety in all jobs.
6. Demonstrate proper fire prevention techniques to be used at the job site.
7. Demonstrate ability to use copy machine.
8. Assemble, collate, and staple duplicated material.
9. Exhibit an awareness of office supplies, their uses and sources.
10. Recognize the importance of confidentiality and privacy laws.
11. Understand the value and importance of the following machines in business: calculator, typewriter, copy machine, transcribing machine, postage machine, microcomputer, telephone, and others.
12. Learn and apply rules for alphabetic indexing.
13. Learn and apply rules for numeric indexing.

EXIT POINT: Receptionist (CIP Code: 07.0707)

UNIT IX: Filing

Competencies:

1. Demonstrate proper filing procedure including collecting material to be filed, inspecting for time stamp/release mark, indexing, coding, cross-referencing, sorting, placing cards in file and arranging records in file.
2. Learn and apply rules for subject and geographical filing.
3. Understand the criteria by which records are created, stored, retrieved, retained, and disposed of.

4. Demonstrate proper procedures for the operation and control of manual and electronic storage systems.
5. Learn and apply rules for medical and legal records and management.
6. Identify procedures to establish file systems.
7. Describe the following filing equipment: vertical file, lateral/shelf file, folders, guides, labels, sorters, and staplers.
8. Describe the following special filing systems: card files (visible index, rotary wheel, tickler, and vertical), microfilm, microfiche, and elevator file.

EXIT POINT: Records Control Clerk (CIP Code: 07.9999)

UNIT X: Business Correspondence

Competencies:

1. Compose and type all types of business letters and other written communication.
2. Proofread and edit typewritten and handwritten material and evaluate its acceptability as a finished piece.

UNIT XI: Typing

Competencies:

1. Prepare usable copy by making neat erasures and by crowding and spreading letters.
2. Make typed corrections on typewritten materials that have been removed from typewriter.
3. Establish the standard of mailability for all production work.
4. Learn to arrange material attractively.
5. Center material vertically and horizontally on paper of any size.
6. Type from rough draft and handwritten letters, reports, and statistical materials.
7. Prepare carbon copy.
8. Type letters, tables, and reports of varying levels of difficulty using electronic typewriters or microcomputers.
9. Type different letter styles applying rules of mixed and open punctuation.
10. Demonstrate knowledge of special parts of letters.
11. Type envelopes using the latest address styles recommended by postal officials.
12. Type letters using various sizes of stationery and letterheads.
13. Apply rules for second page heading styles.
14. Type business forms and statistical communications.
15. Type interoffice memorandum with tables, headings, and correct margins using printed and unprinted forms.
16. Type advanced legal, medical, technical, and governmental documents.
17. Type at a minimum of 50 words per minute from straight copy for five minutes with five or fewer errors.

UNIT XII: Machine Transcription

Competencies:

1. Become proficient in the operation of the transcription equipment.
2. Transcribe documents, including legal and medical materials, from the transcription machine.

EXIT POINT: Clerk-Typist (CIP Code: 07.0702)

UNIT XIII: Word Processing

Competencies:

1. Understand basic word processing concepts and terminology.
2. Demonstrate proficiency in inputting letters and manuscripts.
3. Demonstrate proficiency in inputting documents containing columns, tables, and charts.
4. Demonstrate proficiency in advanced editing including highlighting, search and replace, cut and paste/block and move, rulers, headers and footers, formatting, paginating, proofreading, etc.

5. Demonstrate proficiency in advanced list processing/mailmerge.
6. Save and print documents using various print options.
7. Demonstrate proficiency in the use of various software and hardware manuals.
8. Perform practical applications and set up documents from rough-draft materials.
9. Identify and describe the procedures involved in the use of electronic mail.
10. Identify and describe some of the various word processing software packages on the market.
11. Perform spreadsheet applications.
12. Perform data base applications.

UNIT XIV: Job Seeking Skills

Competencies:

1. Perpare a personal resume.
2. Fill out a job application.
3. Prepare a letter of application.
4. Prepare a follow-up letter.
5. Participate in a mock job interview.
6. Prepare a letter of resignation.
7. Demonstrate familiarity with the following sources of job information: newspaper ads, job service, school placement, employment agencies, and personal contacts.
8. Evaluate and compare job opportunities to determine adequacy of the job to meet personal and financial need.
9. Make an appointment for a job interview.

COMMUNICATIONS

Television Production

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Communications **Course Title:** Television Production

CIP Code: 10.0104 **Course Length** 2025 Clock Hours - 18 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical shop experience to prepare students for employment in a variety of jobs in the field of Television Production or to provide supplemental training for persons previously or currently employed in related television production/broadcasting occupations.

The Television Production course generally prepares individuals to support broadcast managers in the production of materials and the production and broadcasting of materials or programs. Includes instruction in the equipment, processes, and procedures used in producing and making of television broadcasts; various components, specialized equipment, and systems of devices employed in broadcast operations; electronic communication, both field and television studio production; script and program preparation; photographic and audiorecording of material to be broadcast; monitoring, modulating, and controlling the broadcast processes; and recording and storing broadcast materials.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The content is organized into competency-based units of instruction which specify occupational competencies which the student must successfully complete.

Units of Instruction:

I. Introduction to Television Production
II. Production Crew
III. Camera Structure and Lens Design
IV. Camera Operations
V. Television Lighting Equipment and Techniques
VI. Audio Equipment and Techniques
VII. Function and Operation of a Video Tape Recorder
VIII. Production and Editing Procedures
IX. On-Camera Talent
X. Duties of a Technical Director
XI. Director/Producer
XII. Human Relations
XIII. Job Seeking Skills

Curriculum Competency Outline

UNIT I: Introduction to Television Production

Competencies:

1. Identify terms associated with television production.
2. Demonstrate a knowledge of job requirements.
3. Demonstrate a knowledge of the working conditions of a television production crew.
4. Demonstrate a knowledge of career opportunities.
5. Demonstrate a knowledge of dress code requirements.
6. Identify safety hazards associated with television production.
7. Demonstrate a knowledge of the salaries and benefits available to members of a television production crew.

UNIT II: Production Crew

Competencies:
1. Identify terms associated with production crews.
2. Identify the various members of a television production crew.
3. Identify the duties and responsibilities of the various members of a television production crew.
4. Describe the lines of authority in a television production crew.

UNIT III: Camera Structure and Lens Design

Competencies:
1. Identify terms associated with camera structure and lens design.
2. Construct a block diagram and describe the signal flow.
3. Identify the basic components of a television camera.
4. Identify the characteristics of camera lenses.

UNIT IV: Camera Operations

Competencies:
1. Identify terms associated with camera operations.
2. Perform various designated camera movements.
3. Discuss picture composition.
4. Identify the "rule of thirds" in picture composition.
5. Describe camera limitations and operational requirements in the field/studio.
6. Describe the factors that affect video operations.
7. Determine exposure using an incident meter and a waveform monitor.
8. Differentiate between electronic news gathering (ENG) and electronic field production (EFP).
9. Discuss balance, angles, and frames within the frame.
10. Identify safety hazards associated with camera operations.
11. Apply safety practices.

UNIT V: Television Lighting Equipment and Techniques

Competencies:
1. Identify terms associated with television lighting and equipment.
2. Demonstrate a basic knowledge of field/studio lighting requirements.
3. Demonstrate three-point lighting techniques.
4. Demonstrate special lighting techniques.
5. Measure light using a light meter.
6. Design and execute lighting plots for field/studio productions.
7. Perform setup, strike, and maintenance of sets in field/studio.
8. Identify safety hazards associated with lighting in field/studio.
9. Apply safety practices.

UNIT VI: Audio Equipment and Techniques

Competencies:
1. Identify terms associated with audio equipment and techniques.
2. Identify various microphone pickup patterns.
3. Identify audio problems in the field/studio.
4. Demonstrate a basic knowledge of field/studio audio techniques.
5. Demonstrate the ability to operate audio equipment to industry standards.
6. Identify safety hazards associated with the operation of audio equipment.
7. Apply safety practices.

UNIT VII: Function and Operation of a Video Tape Recorder

Competencies:
1. Identify terms associated with video tape recorders.
2. Describe the basic electronic operation of a video tape recorder.
3. Describe the various video recording formats and functions.

4. Describe the video recorder operations and controls.
5. Identify the basic principles of how audio and video is recorded on video tape.
6. Identify safety hazards associated with video tape recording.
7. Apply safety practices.

UNIT VIII: Production and Editing Procedures

Competencies:
1. Identify terms associated with production and editing operations.
2. Identify steps in pre-production, production, and post-production.
3. Discuss electronic news gathering (ENG) versus electronic field production (EFP) requirements.
4. Describe pre-production/post-production editing principles and requirements.
5. Demonstrate the ability to tell a story using video only.
6. Describe "shooting with editing in mind."
7. Demonstrate the electronic transfer edit concept.
8. Demonstrate the ability to construct a shot sequency by story boarding, picture composition, and editing techniques.
9. Describe duplication (dub), on-line editing, and off-line editing.
10. Demonstrate the ability to communicate with the director in planning shot sequence for proper editing techniques.
11. Demonstrate assemble editing and butt editing techniques.
12. Identify natural (NAT) sound characteristics and techniques.
13. Identify voice-over characteristics and techniques.
14. Identify cut-away shots.
15. Perform machine-to-machine editing techniques.
16. Perform an insert edit technique.

UNIT IX: On-Camera Talent

Competencies:
1. Identify terms associated with on-camera talent.
2. Identify the factors that affect on-camera talent.
3. Discuss clothing color requirements.
4. Discuss jewelry requirements.
5. Perform basic facial make-up for television field/studio applications.
6. Discuss crew relationships and responsibilities with on-camera talent.
7. Discuss working with talent techniques.

UNIT X: Duties of a Technical Director

Competencies:
1. Identify terms associated with technical director activities.
2. Identify the duties of the technical director.
3. Perform the duties of a technical director.

UNIT XI: Director/Producer

Competencies:
1. Identify terms associated with director/producer activities.
2. Identify the duties of a director/producer.
3. Perform the duties of a director/producer.
4. Review prepared script and develop visualization with camera angles and lighting effects.
5. Produce and direct a music video.
6. Produce and direct a talk show.
7. Critique video productions.
8. Identify field directing ENG/EFP vs. studio directing.
9. Discuss talent release.
10. Discuss contracts.

UNIT XII: Human Relations

Competencies:

1. Identify terms associated with human relations.
2. Demonstrate a willingness to learn.
3. Demonstrate a professional attitude.
4. Demonstrate the ability to be a good listener.
5. Demonstrate the ability to follow oral and written instructions.
6. Demonstrate the ability to communicate instructions accurately and effectively.
7. Demonstrate high reliability in the performance of duties.
8. Demonstrate problem-solving skills.
9. Demonstrate punctuality.
10. Exhibit pride and loyalty.
11. Comply with safety and health rules.
12. Demonstrate personal hygiene and cleanliness.
13. Show empathy, respect, and support for others.
14. Write legibly.

UNIT XIII: Job Seeking Skills

Competencies:

1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.
5. Write a letter of application.
6. Complete a job application.
7. Participate in a mock interview.
8. Write a follow-up letter.
9. Conduct a job search.
10. Write a letter of resignation.

CONSUMER, PERSONAL, AND MISCELLANEOUS SERVICES

Barbering
Cosmetology

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Consumer, Personal, and Miscellaneous Services **Course Title:** Barbering

CIP Code: 12.0402 **Course Length** 1575 Clock Hours - 14 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical shop experience to prepare students for employment in the field of Barbering or to provide supplemental training for persons previously or currently employed in Barbering.

The course prepares individuals to cut, shampoo, and style hair, and to shave. Special attention is given to hygiene, skin and scalp disease, and equipment sterilization. Instruction is designed to qualify students for the Louisiana Barber License Examination.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The content is organized into competency-based units of instruction which specify occupational competencies which the student must successfully complete.

Units of Instruction:

I. Introduction to Barbering
II. Laws and Regulations
III. Implements
IV. Sanitation and Safety
V. Shampooing
VI. Taper Haircut
VII. Men's Haircutting
VIII. Women's Haircutting
IX. Shaving
X. Massage and Facials
XI. Skin and Scalp
XII. Hair
XIII. Chemicals
XIV. Chemistry
XV. Anatomy and Physiology
XVI. Shop Management and Salesmanship
XVII. Employment Preparation

Curriculum Competency Outline

UNIT I: Introduction to Barbering

Competencies:

1. Explain history of barbering.
2. Become oriented to the practice of barbering.
3. Discuss professional ethics.
4. Identify shop safety hazards.
5. Explain physical and mental stress.

UNIT II.: Laws and Regulations

Competencies:
1. Explain or discuss statutory regulations.
2. Explain rules and regulations for students.
3. Explain rules and regulations for shop management.
4. Explain rules and regulations for licensed barbers.

UNIT III: Implements

Competencies:
1. Identify implements.
2. Establish proper handling of implements.
3. Demonstrate proper use of implements.
4. Demonstrate proper care and sanitation of implements.

UNIT IV: Sanitation and Safety

Competencies:
1. Identify and classify types of bacteria.
2. Identify types of sterilization.
3. Describe needs for sanitation and safety.
4. Identify methods of sterilization.
5. Identify State Board requirements for sanitation.

UNIT V: Shampooing

Competencies:
1. Analyze clients' hair and scalp needs.
2. Determine appropriate solutions.
3. Apply appropriate solutions.
4. Perform correct shampooing and rinsing procedures.

UNIT VI: Taper Haircut

Competencies:
1. Demonstrate proper handling of tools for tapering.
2. Describe and demonstrate side and back taper.
3. Analyze clients' hair and determine proper procedure.
4. Blend and balance haircut.

UNIT VII: Men's Haircutting

Competencies:
1. Define style haircutting.
2. Determine style.
3. Demonstrate basic layer cut, length and section tie-ends.
4. Demonstrate balance and proper finish-up work.
5. Define razor haircutting.
6. Demonstrate proper razor haircutting techniques.
7. Identify types of hairpieces.
8. Demonstrate proper fit and cut of hairpiece.
9. Demonstrate proper care of hairpiece.

UNIT VIII: Women's Haircutting

Competencies:
1. Define women's haircutting.
2. Describe different lengths and techniques.
3. Analyze women's features.
4. Determine style.
5. Demonstrate methods of cutting and styling techniques.

UNIT IX: Shaving

Competencies:
1. Analyze clients' skin and beard.
2. Define proper facial conditioning for shaving.
3. Perform proper sanitation procedures.
4. Prepare face for shaving.
5. Demonstrate standing position and razor strokes.
6. Demonstrate proper finish procedures.
7. Demonstrate different beard styles and trimming techniques.

UNIT X: Massage and Facials

Competencies:
1. Identify types of massages and facials.
2. Discuss types of masks and creams.
3. Apply masks and creams.
4. Demonstrate proper hand manipulations.

UNIT XI: Skin and Scalp

Competencies:
1. Analyze structure and function of the skin.
2. Identify and describe types of disorders of the skin and scalp.
3. Identify the differences between contagious and noncontagious disorders of the skin and scalp.

UNIT XII: Hair

Competencies:
1. Identify functions of hair.
2. Identify structure of hair.

UNIT XIII: Chemicals

Competencies:
1. Identify dangers of hair chemicals.
2. Identify the hair type and appropriate solution.
3. Identify types of permanent waves.
4. Demonstrate types of permanent waves.
5. Determine rod size and demonstrate procedure for wrapping hair.
6. Identify hair types and appropriate hair relaxer for desired effects.
7. Identify the hair type and appropriate hair color.
8. Demonstrate the difference between temporary hair color, semi-permanent, and permanent hair color.
9. Perform proper mixing of colors.
10. Demonstrate the typical uses of bleach.
11. Demonstrate proper application and removal of hair chemicals
12. Demonstrate proper processing time for permanent waves, relaxers, color, and bleach.

UNIT XIV: Chemistry

Competencies:
1. Identify types and definitions of compounds.
2. Identify the difference between physical mixture and chemical mixture.
3. Identify the difference between hard and soft water.
4. Identify types of cosmetics.
5. Apply cosmetics.

UNIT XV: Anatomy and Physiology

Competencies:
1. Identify the different cells and their functions.
2. Identify and give the functions of each body system.

UNIT XVI: Shop Management and Salesmanship

Competencies:
1. Identify State Board requirements for shop management.
2. Identify factors involved in financing, leasing, and selecting locations.
3. Identify personal shop duties.
4. Set up and maintain records.
5. Discuss advertising and promotional ideas for products.

UNIT XVII: Employment Preparation

Competencies:
1. Explain the procedure for obtaining and renewing a license to practice.
2. Describe the role of the barber relating to legal responsibilities.
3. Prepare a personal resume'.
4. Complete a job application.
5. Describe procedure for resignation.
6. Write a letter of resignation.
7. Participate in a mock interview.
8. Discuss Equal Opportunity Employment provisions and Affirmative Action policies in the work place.
9. Promote public relations within the work place.
10. Discuss State Board Exam review.
11. Discuss the transition from barbering school to the work place.
12. Establish benefits provided by the shop or available through the shop.
13. Discuss with shop owner methods used to pay income taxes and Social Security taxes.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Consumer, Personal, and Miscellaneous Services **Course Title:** Cosmetology

CIP Code: 12.0403 **Course Length** 1350 Clock Hours - 12 Months

Course Description:

The purpose of the Cosmetology course is to prepare students for employment in positions as beauticians and hair stylists. Classroom instruction includes anatomy and physiology, sanitation, shampooing, hair shaping and styling, coloring, and salon operations. The training consists of practical work experience in a well-equipped beauty salon located at the school.

Upon graduation students receive a diploma which entitles them to take the licensure examination given by the Louisiana State Board of Cosmetology. A high school education or its equivalent is required for admission to this course which is approved by the Louisiana State Board of Cosmetology.

Units of Instruction:
I. Introduction to Cosmetology
II. Sanitation
III. Shampooing, Rinsing, Conditioning and Chemistry
IV. Manicuring and Pedicuring
V. Electricity and Light Therapy
VI. Dermatology
VII. Anatomy and Physiology
VIII. Facial Treatments and Massage
IX. Cosmetic Makeovers
X. Hair Shaping
XI. Hair Styling
XII. Permanent Waving
XIII. Chemical Hair Relaxing
XIV. Thermal Services
XV. Hair Coloring and Chemistry
XVI. Wigs and Hair Accessories
XVII. Salon Management
XVIII. Employment Preparation

Curriculum Competency Outline

UNIT I: Introduction to Cosmetology

Competencies:
1. Explain history of cosmetology.
2. Become oriented to the practice of cosmetology.
3. Discuss professional ethics and appearance.
4. Identify shop safety hazards.
5. Explain physical and mental stress.
6. Identify Louisiana State Board of Cosmetology regulations.

UNIT II: Sanitation

Competencies:
1. Classify types of bacteria.
2. Discuss needs and methods of sanitation.
3. Perform sanitation procedures.

UNIT III: Shampooing, Rinsing, Conditioning and Chemistry

Competencies:
1. Discuss hair structure.
2. Analyze client's hair.
3. Select proper shampoo, conditioner, and rinse.
4. Perform shampoo procedure.

UNIT IV: Manicuring and Pedicuring

Competencies:
1. Explain structure of the nail.
2. Identify disorders and diseases of the nail.
3. Identify implements, supplies, and materials.
4. Give a plain manicure.
5. Give an oil manicure.
6. Massage hand and arm.
7. Apply artificial nails.
8. Use nail design techniques.
9. Give a pedicure.

UNIT V: Electricity and Light Therapy

Competencies:
1. Identify types of electric currents and their use in the salon.
2. Discuss light therapy and their methods of application.
3. Discuss electrical equipment used in a salon.
4. Identify safety hazards.
5. Apply safety practices in electricity.

UNIT VI: Dermatology

Competencies:
1. Identify layers of the skin.
2. Identify functions of the skin, scalp, and hair.
3. Identify disorders and diseases of the skin, scalp, and hair.
4. Perform services for identified disorders.

UNIT VII: Anatomy and Physiology

Competencies:
1. Identify all the systems of the body and give the functions of each.
2. Identify the bones, nerves, and muscles as they relate to cosmetology.

UNIT VIII: Facial Treatments and Massage

Competencies:
1. Analyze skin.
2. Determine type of facial needed.
3. Discuss electrical equipment and hand manipulations.
4. Perform facial massage movements.
5. Perform other massage movements.
6. Perform facial using electrical equipment.

UNIT IX: Cosmetic Makeovers

Competencies:
1. Identify facial shapes.
2. Apply facial make-up.

3. Perform corrective techniques.
4. Perform eyebrow arching.
5. Apply false eyelashes.
6. Perform temporary hair removal.
7. Perform permanent hair removal.

UNIT X: Hair Shaping

Competencies:
1. Identify implements used for hair shaping.
2. Use basic hair shaping implements.
3. Perform basic hair shaping techniques.
4. Perform fashion hair shaping.

UNIT XI: Hair Styling

Competencies:
1. Identify implements and supplies.
2. Analyze facial shapes, profiles, and body structures.
3. Perform finger waving.
4. Perform pin curls.
5. Perform roller placement.
6. Perform brush wave and skip wave.
7. Perform braid styling.
8. Perform fashion hair styles.
9. Perform artistry of comb-out.

UNIT XII: Permanent Waving

Competencies:
1. Identify implements and supplies.
2. Observe safety measures.
3. Analyze hair and scalp.
4. Select type of wave solution and rods for type of hair.
5. Wrap hair on wave rods.
6. Process and neutralize the permanent wave.
7. Perform after-care procedures.

UNIT XIII: Chemical Hair Relaxing

Competencies:
1. Identify implements, materials, and supplies.
2. Observe safety measures.
3. Analyze hair and scalp.
4. Select type of relaxer needed.
5. Perform a virgin chemical relaxer.
6. Perform a retouch chemical relaxer.

UNIT XIV: Thermal Services

Competencies:
1. Identify implements, materials, and supplies.
2. Observe safety measures.
3. Analyze hair and scalp.
4. Perform thermal service.

UNIT XV: Hair Coloring and Chemistry

Competencies:
1. Identify implements, materials, and supplies.
2. Observe safety measures.
3. Analyze hair and scalp.
4. Select proper hair color needed and make record card.

5. Perform temporary hair coloring.
6. Perform semi-permanent hair coloring.
7. Perform permanent hair coloring.
8. Perform hair lightening.
9. Perform double application coloring.
10. Perform tint-back-to-natural coloring.
11. Perform fillers.
12. Perform various high-fashion techniques.
13. Discuss problems related to coloring.

UNIT XVI: Wigs and Hair Accessories

Competencies:

1. Identify types of wigs and accessories.
2. Discuss care of each type.
3. Discuss use of accessories.

UNIT XVII: Salon Management

Competencies:

1. Identify Louisiana State Board requirements for shop management.
2. Discuss booth rental licensing in Louisiana.
3. Identify factors involved in financing, leasing, and selecting salon location.
4. Identify personal shop duties.
5. Set up and maintain records.
6. Discuss advertising and promotional ideas for products.

UNIT XVIII: Employment Preparation

Competencies:

1. Explain the procedure for obtaining and renewing a license to practice.
2. Describe the role of the cosmetologist relating to legal responsibilities.
3. Prepare a personal resume'.
4. Complete a job application.
5. Describe procedure for resignation.
6. Write a letter of resignation.
7. Participate in a mock interview.
8. Discuss Equal Opportunity Employment provisions and Affirmative Action policies in the work place.
9. Promote public relations within the work place.
10. Perform State Board examination review.
11. Discuss the transition from cosmetology school to the work place.
12. Establish benefits provided by the shop or available through the salon.
13. Discuss with salon owners the method used to pay income taxes and Social Security taxes.

ENGINEERING

Biomedical Equipment Technology
Civil Engineering Technology
Drafting and Design Technology
Electromechanical Technology
Motor Vessel Engineer
Nondestructive Testing
Process Technician

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education
Competency-Based Course Outline

Program Area: Engineering

Course Title: Biomedical Equipment Technology

CIP Code: 15.0401

Course Length 2700 Clock Hours - 24 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical shop experience to prepare students for employment in a variety of jobs in the field of Biomedical Equipment Technology or to provide supplemental training for persons previously or currently employed in related biomedical equipment occupations.

The Biomedical Equipment Technology course generally prepares individuals to manufacture, install, calibrate, operate, and maintain sophisticated life-support equipment found in hospitals, medical centers, and research laboratories. Includes instruction in the use of testing and diagnostic instruments; calibrating techniques; potential hazards and safety precautions; and methods of installation, repair, maintenance, and operation of the equipment. Participation in supervised activities directed towards the use, care/maintenance, and servicing of biomedical equipment in a designated hospital and/or medical/research center environment is a requirement of this course prior to the successful completion of all occupational competencies identified in this course.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The content is organized into competency-based units of instruction which specify occupational competencies which the student must successfully complete.

Units of Instruction:

FIRST YEAR

I. Fundamentals of Electricity/Electronics
II. Mathematics
III. Physics
IV. Fundamentals of Semiconductors
V. Basic Electronic Circuits
VI. Digital Electronics
VII. Basic Microprocessors
VIII. Computer Literacy

SECOND YEAR

IX. Introduction to Biomedical Equipment Technology
X. Anatomy and Physiology
XI. Medical Terminology
XII. Communications
XIII. Electrical Distribution System
XIV. Monitoring Equipment
XV. Surgical and Anesthesiology Equipment
XVI. Central Supply Equipment
XVII. Physical Medical Equipment
XVIII. Respiratory Equipment
XIX. Laboratory Equipment
XX. Diagnostic Imaging
XXI. Light Amplification by Stimulated Emissions of Radiation (Laser) Equipment
XXII. Fluid Systems
XXIII. Miscellaneous Hospital Equipment
XXIV. Codes and Standards
XXV. Business Practices
XXVI. Practicum
XXVII. Job Seeking Skills

Curriculum Competency Outline

FIRST YEAR

UNIT I: Fundamentals of Electricity/Electronics

Competencies:

1. Demonstrate a knowledge of occupational job requirements, working conditions, safety hazards, pay scales, and career opportunities.
2. Identify safety hazards.
3. Demonstrate a knowledge of common safety rules and regulations.
4. Identify hand tools.
5. Demonstrate proper techniques and use of hand tools.
6. Apply correct soldering techniques.
7. Identify electrical/electronic test instruments.
8. Perform measurements using electrical/electronic test instruments.
9. Identify terms associated with electricity/electronics.
10. Identify electrical/electronic symbols.
11. Identify electrical/electronic formulas.
12. Identify electrical/electronic components.
13. Display a knowledge of atomic theory.
14. Demonstrate a knowledge of theory of ac and dc current flow.
15. Solve problems using the basic laws governing electron flow.
16. Connect electrical/electronic components in specified circuit configuration.
17. Apply safety practices.

UNIT II: Mathematics

Competencies:

1. Solve problems dealing with fractions, percentages, ratio and proportion, and powers of ten.
2. Solve problems of plane and solid geometry.
3. Solve problems using algebraic formulas.
4. Solve problems using logarithms.
5. Apply the principles in trigonometry in solving problems.
6. Solve problems using a scientific electronic calculator.

UNIT III: Physics

Competencies:

1. State the properties of matter.
2. Demonstrate the applications and effects of force, work, rate, momentum, resistance, power, potential and kinetic energy, force transformers, energy converters, transducers, vibration and waves, time constants, and radiation using mechanical energy systems.
3. Demonstrate the applications and effects of force, work, rate, momentum, resistance, power, potential and kinetic energy, force transformers, energy converters, transducers, vibration and waves, time constants, and radiation using fluidal energy systems.
4. Demonstrate the applications and effects of force, rate, resistance, power, potential and kinetic energy, force transformers, energy converters, transducers, vibration and waves, time constants, and radiation using electrical energy systems.
5. Demonstrate the applications and effects of force, work, rate, resistance, power, potential and kinetic energy, energy converters, transducers, time constants, and radiation using thermal energy systems.

UNIT IV: Fundamentals of Semiconductors

Competencies:

1. Identify terms associated with semiconductors.
2. Identify semiconductor symbols.
3. Identify semiconductor components.
4. Describe the characteristics of semiconductors.
5. Test various semiconductor devices.
6. Interpret semiconductor specification sheets.
7. Demonstrate the procedures for testing and servicing semiconductors.
8. Identify safety hazards associated with semiconductor devices.
9. Apply safety practices.

UNIT V: Basic Electronic Circuits

Competencies:

1. Identify terms associated with power supplies, amplifiers, and oscillators.
2. Identify schematic representations of power supplies, amplifiers, and oscillator circuits.
3. State the theory of operation of power supply circuits, amplifier circuits and oscillator circuits.
4. Construct and analyze various power supply circuits, amplifier circuits, and oscillator circuits.
5. Identify safety practices associated with basic electronic circuits.
6. Apply safety practices.

UNIT VI: Digital Electronics

Competencies:

1. Identify logic gate configuration.
2. Describe the truth tables associated with various logic circuits.
3. Simplify logic circuits using specified techniques.
4. Interpret integrated circuit specification sheets.
5. Identify registers, counters, multivibrators (bistable, monostable, etc.) and display devices.
6. Describe digital-to-analog and analog-to-digital techniques.
7. Analyze digital arithmetic circuits.
8. Identify safety hazards associated with digital circuits.
9. Apply safety practices.

UNIT VII: Basic Microprocessors

Competencies:

1. Identify terms associated with microprocessors.
2. Describe the basic architecture of a microprocessor.
3. Describe the basic operation of a microprocessor.
4. Demonstrate a fundamental knowledge of assembly language programming.
5. Describe system interfacing circuits and techniques.

UNIT VIII: Computer Literacy

Competencies:

1. Identify terms associated with computers.
2. Identify the impact of computers on today's society.
3. Demonstrate ability to select hardware and software components.

SECOND YEAR

UNIT IX: Introduction to Biomedical Equipment Technology

Competencies:
1. Identify terms associated with biomedical equipment technology.
2. Demonstrate a knowledge of job requirements.
3. Identify safety hazards associated with the biomedical equipment technology occupations.
4. Demonstrate a knowledge of the working conditions of a biomedical technician.
5. Demonstrate a knowledge of career opportunities.
6. Demonstrate an awareness of biomedical ethics.
7. Demonstrate a knowledge of the various trade/professional publications available to the biomedical equipment technician.
8. Demonstrate a knowledge of the various trade/professional organizations available to the biomedical equipment technician.
9. Demonstrate a knowledge of the salary schedules and benefits available to a biomedical equipment technician.
10. Demonstrate a knowledge of codes and standards requirements for a biomedical equipment technician.
11. Demonstrate a knowledge of certification requirements.

UNIT X: Anatomy and Physiology

Competencies:
1. Identify terms associated with anatomy and physiology.
2. Identify the various systems of the human body.
3. Describe the functions of the various systems of the human body.
4. Describe the abnormalities that affect the human body.
5. Demonstrate a knowledge of the measurable parameters of human body functions.

UNIT XI: Medical Terminology

Competencies:
1. Identify terms associated with surgical procedures.
2. Identify terms associated with medical instrumentation.
3. Demonstrate the ability to perform measurement unit conversions.
4. Identify terms associated with the various hospital departments.

UNIT XII: Communications

Competencies:
1. Demonstrate the ability to speak effectively.
2. Demonstrate a willingness to learn.
3. Demonstrate a professional attitude.
4. Demonstrate the ability to be a good listener.
5. Demonstrate the ability to follow oral and written instructions.
6. Demonstrate the ability to communicate instructions accurately and effectively.
7. Demonstrate high reliability in the performance of duties.
8. Demonstrate problem-solving skills.
9. Demonstrate punctuality.
10. Exhibit pride and loyalty.
11. Comply with safety and health rules.
12. Demonstrate personal hygiene and cleanliness.
13. Show empathy, respect, and support for others.
14. Write legibly.
15. Implement hospital policies in dealing with others.
16. Practice good telephone etiquette.
17. Demonstrate the ability to write an effective technical report.
18. Demonstrate the ability to conduct a demonstration.

UNIT XIII: Electrical Distribution System

Competencies:
1. Identify terms associated with Uninterruptible Power Supply (UPS) systems.
2. Identify the various types of UPS systems.
3. Describe the applications of the various types of UPS systems.
4. Calculate UPS capacity.

5. Perform preventive maintenance.
6. Troubleshoot UPS system.
7. Identify safety hazards associated with UPS systems.
8. Identify terms associated with isolated power systems.
9. Describe the applications of isolated power supply.
10. Perform preventive maintenance.
11. Troubleshoot isolated power systems.
12. Identify safety hazards associated with isolated power systems.
13. Identify terms associated with ground fault interrupters.
14. Identify the various types of ground fault interrupters.
15. Identify the various applications of ground fault interrupters.
16. Perform preventive maintenance.
17. Identify problems associated with line voltage transients.
18. Identify problems associated with terrestrial interference.
19. Identify problems associated with poor grounding.
20. Identify the various components of an electrical distribution panel.
21. Identify types of three-phase distribution systems.
22. Identify distribution panel/receptable live connections, neutrals, and grounds.
23. Identify various types of electric motors.
24. Troubleshoot electric motor problems.
25. Identify various types of emergency generators.
26. Describe the typical emergency power system.
27. Describe the testing procedures to be used in checking emergency power systems.
28. Describe equi-potential grounding systems.
29. Identify the various types of test equipment used in checking and servicing electrical distribution systems.
30. Perform electrical checks using test equipment.
31. Identify safety hazards associated with checking and servicing electric motors, emergency generators, and related components of an electrical distribution system.
32. Apply safety practices in the use, servicing, and testing of electrical distribution systems.

UNIT XIV: Monitoring Equipment

Competencies:

1. Identify terms associated with monitoring equipment.
2. Identify the various types of monitoring equipment.
3. Describe the operation and function of invasive/noninvasive physiological patient monitors.
4. Draw block diagrams of the various types of patient monitors.
5. Demonstrate a knowledge of the networking techniques utilized with monitoring equipment.
6. Demonstrate a knowledge of interfacing monitoring equipment to the patient.
7. Describe the operation and function of a defibrillator/monitor.
8. Draw a block diagram of a defibrillator/monitor.
9. Demonstrate the ability to troubleshoot monitoring systems.
10. Identify and use test equipment for the repair and calibration of monitoring equipment.
11. Read and interpret schematics.
12. Identify safety hazards associated with monitoring equipment.
13. Apply safety practices.

UNIT XV: Surgical and Anesthesiology Equipment

Competencies:

1. Identify terms associated with surgical equipment.
2. Identify the various types of equipment found in surgical suites.
3. Demonstrate the ability to observe surgical room protocol, attire, environmental requirements, and sterile areas.

4. Describe the operation and function of electrosurgical equipment.
5. Describe the operation and function of a surgical microscope.
6. Describe the operation and function of a fiber-optic light source.
7. Describe the operation and function of surgical vacuum systems and pumps.
8. Demonstrate the ability to set up surgical room video equipment.
9. Identify terms associated with anesthesiology equipment.
10. Identify the various types of anesthesiology equipment.
11. Describe the operation and functions of various anesthesiology equipment.
12. Identify test equipment used to check anesthesiology equipment.
13. Describe the operation and function of cryo-surgical instruments.
14. Use test equipment to check surgical and anesthesiology equipment.
15. Identify safety hazards associated with surgical and anesthesiology equipment.
16. Apply safety practices.

UNIT XVI: Central Supply Equipment

Competencies:

1. Identify terms associated with central supply equipment.
2. Identify the various types of equipment found in central supply.
3. Describe the operation and function of hypo-hyperthermia units.
4. Describe the operation and function of infusion devices.
5. Describe the operation and function of suction devices and regulators.
6. Describe the operation and function of electronic thermometers.
7. Describe the operation and function of manual and electronic blood pressure cuffs.
8. Describe the operation and function of steam and gas sterilizing equipment.
9. Describe the operation and function of various types of patient scales.
10. Read and interpret schematics for central supply equipment.
11. Troubleshoot equipment problems.
12. Repair and adjust/replace defective components.
13. Identify safety hazards associated with central supply equipment.
14. Apply safety practices.

UNIT XVII: Physical Medical Equipment

Competencies:

1. Identify terms associated with physical medical equipment.
2. Identify the various types of physical medical equipment.
3. Describe the operation and function of ultrasonic therapy equipment.
4. Describe the operation and function of diathermy equipment.
5. Describe the operation and function of elecro-galvanic stimulation equipment.
6. Describe the operation and function of lumbar/cervical traction equipment.
7. Describe the operation and function of hydro-therapy equipment.
8. Describe the operation and function of the various types of hot-pack and cold-pack equipment.
9. Describe the operation and function of the electromyograph (EMG).
10. Identify the various types of test equipment associated with physical medical equipment applications.
11. Read and interpret schematics of physical medical equipment.
12. Troubleshoot physical medical equipment problems.
13. Repair and adjust/replace defective components.
14. Identify safety hazards associated with physical medical equipment.
15. Apply safety practices.

UNIT XVIII: Respiratory Equipment

Competencies:

1. Identify terms associated with respiratory therapy.
2. Identify the various types of ventilators/respirators.
3. Describe the operation and function of various types of ventilators/respirators.

4. Identify various types of nebulizers and humidifiers.
5. Describe the operation and function of nebulizers and humidifiers.
6. Measure flow rate.
7. Measure volume.
8. Measure oxygen concentration.
9. Measure pressure.
10. Identify and use test equipment for respiratory equipment calibration.
11. Identify sources and types of hospital gas systems.
12. Identify cylinder gas color coding.
13. Identify specific compressed gas cylinder and hose indexing system.
14. Describe principles of operation of an oxygen analyzer.
15. Demonstrate the use of an oxygen analyzer.
16. Identify safety hazards associated with respiratory equipment.
17. Apply safety practices.

UNIT XIX: Laboratory Equipment

Competencies:

1. Identify terms associated with laboratory equipment.
2. Identify various types of laboratory equipment.
3. Identify chemistry terms and analysis processes associated with laboratory equipment.
4. Perform preventive maintenance on laboratory equipment.
5. Identify safety hazards associated with the servicing of laboratory equipment.
6. Apply safety practices.

UNIT XX: Diagnostic Imaging

Competencies:

1. Identify terms associated with diagnostic imaging.
2. Identify various types of diagnostic imaging equipment.
3. Describe the function of an X-ray unit.
4. Describe the function of an X-ray processor.
5. Identify the various components of radiology equipment.
6. Describe the operation and function of ultrasound imaging equipment.
7. Identify safety hazards associated with diagnostic imaging equipment.
8. Apply safety practices.

UNIT XXI: Light Amplification by Stimulated Emissions of Radiation (Laser) Equipment

Competencies:

1. Identify terms associated with laser equipment.
2. Identify the various types of laser equipment.
3. Describe the characteristics of various types of laser equipment.
4. Describe the applications of various types of laser equipment.
5. Draw a block diagram of a laser system.
6. Identify safety hazards associated with laser equipment.
7. Apply safety practices.

UNIT XXII: Fluid Systems

Competencies:

1. Identify terms associated with fluid systems.
2. Identify the various types of fluid systems.
3. Identify the various applications of fluid systems found in the hospital environment.
4. Identify the components of the various types of fluid systems.
5. Troubleshoot fluid system problems.
6. Repair/replace defective components per manufacturer's specifications.
7. Identify safety hazards associated with fluid systems.
8. Apply safety practices.

UNIT XXIII: Miscellaneous Hospital Equipment

Competencies:

1. Identify terms associated with labor and delivery equipment.
2. Identify terms associated with nursery equipment.
3. Identify terms associated with treatment room equipment.
4. Identify terms associated with dialysis equipment.
5. Identify terms associated with patient room equipment.
6. Identify terms associated with audio-visual equipment.
7. Identify terms associated with rehabilitation equipment.
8. Identify safety hazards associated with labor and delivery equipment.
9. Identify safety hazards associated with nursery equipment.
10. Identify safety hazards associated with servicing dialysis equipment.
11. Apply safety practices.

UNIT XXIV: Codes and Standards

Competencies:

1. Identify terms associated with codes and standards.
2. Demonstrate a knowledge of the various codes and standards as described for the following organizations for the biomedical equipment field:
    a. Association for the Advancement of Medical Instrumentation (AAMI)
    b. American National Standards Institute (ANSI)
    c. Underwriters' Laboratories (UL)
    d. National Fire Protection Association (NFPA)
    e. Joint Commission of Accreditation of Hospitals (JCAH)
    f. Occupational Safety and Health Administration (OSHA)
    g. American Society of Hospital Engineers (ASHE)
    h. Institute of Electrical and Electronic Engineers (IEEE)
    i. American Hospital Association (AHA)
    j. National Electrical Code (NEC)
3. Interpret codes and standards.
4. Demonstrate an awareness of the applications of codes and standards.
5. Apply codes and standards specifications in the performance of maintenance/repair of biomedical equipment.

UNIT XXV: Business Practices

Competencies:

1. Identify terms associated with business/administrative practices.
2. Maintain equipment inventory and parts control.
3. Read and interpret parts/service manuals.
4. Maintain parts/service manuals.
5. Execute maintenance contracts.
6. Construct a medical equipment preventive maintenance program.
7. Identify terms associated with computer functions.
8. Identify the various types of computer functions.
9. Identify the applications of computer functions.
10. Load and boot a computer system.
11. Demonstrate the use of an operating system.
12. Demonstrate the use of operating system utilities.
13. Perform record keeping on data base.
14. Demonstrate proficiency in documenting technical equipment evaluations.
15. Demonstrate an awareness of the importance of complete and accurate documentation of service procedures performed.
16. Demonstrate a knowledge of shipping and receiving practices.
17. Establish relations between suppliers/vendors within the limits of hospital policy.
18. Maintain electrical safety reports.

UNIT XXVI: Practicum

Competency Participate in supervised activities in a hospital environment directed towards the use, care/maintenance, and servicing of biomedical equipment.

UNIT XXVII: Job Seeking Skills

Competencies:

1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.
5. Write a letter of application.
6. Complete a job application.
7. Participate in a mock interview.
8. Write a follow-up letter.
9. Conduct a job search.
10. Write a letter of resignation.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education
Competency-Based Course Outline

Program Area: Engineering

Course Title: Civil Engineering Technology

CIP Code: 15.0201

Course Length 2250 Clock Hours - 20 Months

Course Description:

The purpose of this course is to prepare individuals to assist Civil Engineers in designing of highways, railroads, airports, dams, buildings, and other public projects. This includes surveying, materials testing, layout and drafting of plans and maps, and construction estimating.

Upon completion of this course, the student may take the Engineering Technicians Examination and become a certified Associate Engineering Technician.

The Louisiana Board of Registration for Professional Engineers and Land Surveyors has accepted satisfactory completion of this course as the equivalent of two years of formal education in an approved curriculum above the high school level. This is one of the requirements for registration as a Professional Land Surveyor in the state of Louisiana.

The course is divided into subject areas with each subject area organized into competency-based units of instruction. These units specify occupational competencies which the student must successfully complete.

Subject Areas:

Surveying
Mathematics
Drafting
English
Applied Physics
Statics
Strengths of Materials
Concrete
Asphaltic Concrete
Soil Mechanics
Sanitary Engineering
BASIC Programming
Legal Principles of Surveying
Louisiana Survey Law
United States Public Land Surveys
Map Study and Highway Plan Reading

Units of Instruction:

SURVEYING

I. Occupational Introduction
II. Precision and Accuracy
III. Linear Measurements
IV. Leveling
V. Angles and Directions
VI. The Transit
VII. Traversing

Units of Instruction: (continued)

VIII. Balancing and Adjusting the Traverse
IX. Computing Area
X. Basic Aspects of Land Surveying
XI. Basic Partition Computations
XII. Topographic Surveys
XIII. Construction Surveys
XIV. Determination of Meridian
XV. State Plane Coordinate Systems
XVI. Hydrographic Surveys
XVII. Route Curves
XVIII. Title Search
XIX. Surveying Astronomy
XX. State Plane Coordinates
XXI. Public Land Surveys
XXII. Construction Surveying
XXIII. Control Surveys
XXIV. Global Positioning Systems

MATHEMATICS

I. Introduction to Algebra
II. Linear Equations With One Unknown
III. Introduction to Trigonometry
IV. Trigonometric Applications
V. Systems of Linear Equations
VI. Exponents and Radicals
VII. Logarithms
VIII. Quadratic Equations
IX. Vectors
X. Graphing the Trigonometric Functions
XI. Trigonometric Formulas and Identities
XII. Analytic Geometry
XIII. General Computational Methods
XIV. Intersections

DRAFTING

Basic Drafting:
I. Drafting Instruments, Equipment, and Materials
II. Lettering
III. Geometric Construction
IV. Multiview Drawing
V. Dimensioning
VI. Pictorial Drawing

Survey Map Drafting:
I. Control Traverses
II. Topographic Maps
III. Profiles and Cross Sections
IV. Property Survey Maps
V. Route Surveys
VI. Residential Subdivision Design

Structural Drafting:
I. Industrial Building Terms
II. The Metric System

Units of Instruction: (continued)

III. Welding
IV. Structural Steel Drawings

ENGLISH

I. Reading Improvement
II. Reading Comprehension
III. Technical Reports
IV. Oral Reports
V. Job Seeking Skills

APPLIED PHYSICS

I. Properties of Matter
II. Mechanics
III. Heat
IV. Sound
V. Light and Optics
VI. Magnetism
VII. Basic Electricity

STATICS

I. Force Systems
II. Centroids and Center of Gravity
III. Moments of Inertia
IV. Flexible Cables

STRENGTHS OF MATERIALS

I. Stress and Strain
II. Beams
III. Beam Connections
IV. Columns

CONCRETE

I. Introduction to Portland Cement Concrete
II. Sampling Materials
III. Testing
IV. Mix Design
V. Portland Cement Concrete Plants
VI. Contractor Quality Control Specifications
VII. Louisiana Quality Control Specifications

ASPHALTIC CONCRETE

I. Introduction to Asphaltic Concrete
II. Sampling Materials
III. Plant Inspection
IV. Advanced Plant Inspection
V. Quality Control Specifications

SOIL MECHANICS

I. Soil Deposits
II. Soil Composition
III. Soil Classification
IV. Site Investigation
V. Earth Moving
VI. Foundations

SANITARY ENGINEERING

I. Communicable Diseases
II. General Characteristics, Treatments, and Protection of Water
III. Air Pollution and Its Control
IV. Treatment and Disposal of Human Waste

BASIC PROGRAMMING

I. Introduction
II. Input/Output
III. Arithmetic Operations
IV. Decision Making
V. Interactive Programming
VI. Arrays
VII. Subroutines
VIII. Files

LEGAL PRINCIPLES OF SURVEYING

I. Systems Used to Describe Land
II. Transfer of Real Property
III. Ownership and Land Location
IV. Locating Sequence Conveyances
V. Simultaneous Conveyances Created by State Law
VI. Sectionalized Lands
VII. Locating Reversion Rights
VIII. Riparian and Littoral Owners

LOUISIANA SURVEY LAW

I. Louisiana Civil Code
II. Louisiana Code of Civil Procedure
III. Louisiana Revised Statutes
IV. United States Code (USC) Title 43

UNITED STATES PUBLIC LAND SURVEYS

I. The General Plan
II. The System of Rectangular Surveys
III. Monumentation
IV. Resurveys
V. Special Surveys and Instructions
VI. Field Notes
VII. Plats

MAP STUDY AND HIGHWAY PLAN READING

I. Introduction to Maps
II. Introduction to Air Photos

III. Principles of Map Making
IV. Relief Methods
V. Government Maps
VI. Topographic Maps
VII. Preliminary Map Measurement
VIII. Map Projections and Grid System
IX. Navigation Charts
X. The Earth and Globes
XI. Highway Plan Reading

Curriculum Competency Outline

SURVEYING

UNIT I: Occupational Introduction

Competencies:
1. Describe the history of surveying.
2. Define surveying.
3. Explain classes of surveys.
4. Describe types of surveys.
5. Explain the importance of surveying.
6. Identify opportunities in surveying.

UNIT II: Precision and Accuracy

Competencies:
1. Describe the necessity for accurate surveys.
2. Describe accuracy and precision.
3. Describe errors and mistakes.
4. Describe significant figures.
5. Describe field notes.
6. Set up and index a typical set of field notes.

UNIT III: Linear Measurements

Competencies:
1. Describe methods of measuring distance.
2. Describe taping.
3. Set up notes for taping.
4. Tape distance between several sets of points on level ground.
5. Use method of "breaking tape" to measure distance between one or more sets of points on sloping ground.
6. Use the tape to lay out a right angle.
7. Clean and oil the tape.
8. Explain corrections.
9. Solve problems concerning tape corrections.
10. Describe good taping practice.

UNIT IV: Leveling

Competencies:
1. Describe differential leveling.
2. Set up field notes for differential leveling.
3. Set up the engineer's level.
4. Run lines of differential levels on a closed level circuit.
5. Run lines of differential levels between two or more benchmarks.
6. Describe other types of leveling.
7. Run reciprocal levels across an imaginary or real river.
8. Run profile levels on route traverse.

9. Plot profiles.
10. Explain adjustment of the engineer's level.
11. Check and adjust the level.

UNIT V: Angles and Directions

Competencies:

1. Describe meridians.
2. Describe azimuths and bearings.
3. Convert azimuths to bearings and bearings to azimuths.
4. Describe operation of the compass.
5. Read bearings with a compass.
6. Describe variations in magnetic declination.
7. Set the declination on the transit compass.
8. Explain local attraction.
9. Describe traverse and traverse angle.
10. Describe traverse computations.
11. Solve problems in balancing angles in a traverse.
12. Solve problems involving bearing, azimuth, and deflection angle.
13. Describe magnetic declination problems.
14. Solve problems involving magnetic declination.

UNIT VI: The Transit

Competencies:

1. Describe setting up and leveling the transit.
2. Set up and level the transit.
3. Explain angle measurement.
4. Measure and read horizontal angles with the transit.
5. Close the horizon.
6. Measure horizontal angles by repetition.
7. Measure and read vertical angles with the transit.
8. Explain angle-distance relationship.
9. Solve problems involving angle-distance relationships.
10. Explain intersection of two lines.
11. Use the transit to set the point of intersection between two lines.
12. Explain prolonging a straight line.
13. Prolong a line by the method of double centering.
14. Prolong a line past an obstacle.
15. Explain establishing points on line.
16. Set points on line.
17. Explain balancing in.
18. Perform balancing in between two points.
19. Describe adjustment of the engineer's transit.
20. Check and adjust the transit.

UNIT VII: Traversing

Competencies:

1. Establish and reference a closed polygon traverse.
2. Measure deflection angles of traverse.
3. Measure angles-to-the-right of traverse.
4. Measure interior angles of traverse.
5. Run a traverse as an azimuth traverse using an assigned starting azimuth.

UNIT VIII: Balancing and Adjusting the Traverse

Competencies:

1. Explain balancing angles.
2. Solve problems in balancing traverse angles.
3. Explain importance of reference bearing or azimuth.
4. Describe computation of unadjusted traverse bearings.

5. Solve problems in computation of unadjusted traverse bearings.
6. Describe latitudes and departures.
7. Solve problems in computation of latitudes and departures.
8. Describe error of closure.
9. Compute error of closure.
10. Describe traverse adjustment methods.
11. Adjust latitudes and departures using the compass rule method of adjustment.
12. Describe errors and mistakes.

UNIT IX: Computing Area

Competencies:
1. Explain area by division into triangles.
2. Solve problems in computation of area of a polygon by division into triangles.
3. Explain area by double-meridian-distance (DMD).
4. Solve problems in computation of area of a polygon using DMD.
5. Explain area by trapezoidal rule and Simpson's Rule.
6. Solve problems in computation of area using the trapezoidal rule and Simpson's Rule.
7. Explain use of the polar planimeter.
8. Solve problems in determination of area using the polar planimeter.
9. Explain area by coordinates.
10. Solve problems in computation of area by the coordinate method.
11. Explain area bounded by highway curves.
12. Solve problems in computation of area bounded by a curve.

UNIT X: Basic Aspects of Land Surveying

Competencies:
1. Describe title transfer.
2. Visit recorder's office and examine conveyance records for purpose of familiarization.
3. Describe Common Law.
4. Describe monuments.
5. Identify blaze and hack marks.
6. Explain reason for tree identification.
7. Identify tree regions of Louisiana.
8. Identify trees by their common names.
9. Describe surveying duties.
10. Describe resurveys.
11. Describe metes and bounds surveys.
12. Describe United States public land surveys.

UNIT XI: Basic Partition Computations

Competencies:
1. Explain reasons for parting land.
2. Describe area cut off by a line through two points.
3. Solve problems in computation of area cut off by a line through two points.
4. Describe required area cut off by a line passing through a fixed point.
5. Solve problems in computation of required area cut off by a line passing through a fixed point.
6. Describe required area cut off by a line having a fixed direction.
7. Solve problems in computation of required area cut off by a line having a fixed direction.
8. Describe land tracts and partition.
9. Lay out a tract of land and partition into parcels.

UNIT XII: Topographic Surveys

Competencies:
1. Describe topographic surveys.
2. Run a topographic survey on a tract of land.

3. Describe contours.
4. Implement field procedure for horizontal and inclined stadia sights.
5. Run contours by the trace contour and grid methods.
6. Describe methods of obtaining topography.
7. Locate details of topography.
8. Explain stadia theory.
9. Solve problems involving stadia theory.
10. Explain precision.
11. Explain errors and mistakes.

UNIT XIII: Construction Surveys

Competencies:
1. Discuss building layout.
2. Set up batter boards.
3. Explain grade stakes—slopes and slope stakes.
4. Set grade and slope stakes for a road.
5. Describe borrow pits.
6. Solve problems involving borrow pits.
7. Discuss pipelines.
8. Lay out pipeline right-of-way for a tract of land.

UNIT XIV: Determination of Meridian

Competencies:
1. Identify terms and definitions.
2. Describe star positions.
3. Explain importance of time.
4. Obtain correct time from WWV radio station.
5. Determine watch correction.
6. Explain determination of azimuth by observation of Polaris.
7. Demonstrate field procedures for observing Polaris.
8. Determine meridian by observation of Polaris.
9. Describe methods of observing the sun.
10. Demonstrate field procedures for observing the sun.
11. Determine the meridian by observing the sun.
12. Explain notes and computations for a solar observation.
13. Determine the meridian from observed field data and solar observation.
14. Explain notes and computations for a Polaris observation.
15. Determine the meridian from observed field data and Polaris observation.
16. Describe sources of error in meridian observation and common mistakes.

UNIT XV: State Plane Coordinate System

Competencies:
1. Describe the Lambert Conformal Projection.
2. Solve problems using the Lambert Conformal Projection.
3. Describe the Transverse Mercator Projection.
4. Solve problems using the Transverse Mercator Projection.
5. Describe use of State Plane Coordinates.
6. Draw a survey on the State Plane Coordinate grid.
7. Compute State Plane Coordinates of property corners from field data.

UNIT XVI: Hydrographic Surveys

Competencies:
1. Identify terms and definitions.
2. Describe methods of obtaining soundings.
3. Describe types of water gages.
4. Explain general theory of tides.
5. Describe stream gaging.

UNIT XVII: Route Curves

Competencies:

1. Describe simple circular curves.
2. Compile data and notes for staking out a simple circular curve.
3. Stake out a simple circular curve.
4. Describe compound curves.
5. Compile data and notes for staking out a compound curve.
6. Stake out a compound curve.
7. Describe vertical curves.
8. Compile data and notes for staking out a vertical curve.
9. Stake out a vertical curve.

UNIT XVII: Title Search

Competencies:

1. Describe parish conveyance records.
2. Visit clerk of court office to examine conveyance and other land records.
3. Research title using conveyance records.

UNIT XIX: Surveying Astronomy

Competencies:

1. Determine correct time from universal time.
2. Describe observation of Polaris for azimuth determination.
3. Solve problems on azimuth.
4. Determine the azimuth of a line by observation of Polaris using the hour-angle method.
5. Describe observations of the sun for azimuth determination.
6. Determine azimuth from solar observations.
7. Determine azimuth from solar observations using the hour-angle method and altitude method.

UNIT XX: State Plane Coordinates

Competencies:

1. Explain mapping angle.
2. Explain geodetic and grid azimuth.
3. Solve problems using geodetic and azimuth.
4. Describe state plane coordinate control data.
5. Solve state plane coordinate problems.
6. Take a property survey and place it on the state plane coordinate grid by traversing from geodetic monuments with reference azimuth.

UNIT XXI: Methods and Computations in Land Surveying

Competencies:

1. Describe closed traverses.
2. Run a transit-tape control traverse.
3. Check and adjust angular closure.
4. Check and adjust the traverse for closure using the compass rule.
5. Calculate coordinates of all traverse stations.
6. Describe field methods of locating points from traverse lines.
7. Take ties to all property corners and other assigned details.
8. Calculate coordinates of all tie points.
9. Explain azimuth/bearings and area from coordinates.
10. Calculate the area of the tract by the coordinate method.
11. Calculate the length and azimuth/bearing of all property lines.
12. Calculate area of circular segments.
13. Describe land parting.

14. Part a tract into two or more parcels.
15. Set property and partition corners.
16. Draw plat of survey.

UNIT XXII: Construction Surveying

Competencies:
1. Describe reference points for construction.
2. Locate construction referencing points.
3. Solve problems on cut and fill slope stakes.
4. Stake out a construction project.
5. Explain transit and laser methods.

UNIT XXIII: Control Surveys

Competencies:
1. Describe horizontal control.
2. Explain accuracy standards and specifications for control surveys.
3. Describe triangulation stations and systems.
4. Explain adjustment of triangles.
5. Solve triangulation problems.
6. Explain adjustment of quadrilateral.
7. Solve quadrilateral problems.
8. Explain trilateration.
9. Solve trilateration problems.

UNIT XXIV: Global Positioning Systems

Competencies:
1. Explain basic geodetic definitions and concepts.
2. Describe equipment and techniques of Doppler positioning.
3. Explain applications for satellite surveying.

MATHEMATICS

UNIT I: Introduction to Algebra

Competencies:
1. Solve signed number problems.
2. Solve algebraic expressions problems.
3. Solve problems involving binomials and polynomials.
4. Solve problems involving fractions.

UNIT II: Linear Equations With One Unknown

Competencies:
1. Solve linear equations.
2. Graph linear equations.
3. Solve formulas.
4. Solve problems using slope distance and midpoint formula.
5. Solve ratio and proportion problems.

UNIT III: Introduction to Trigonometry

Competencies:
1. Determine angles of the right triangle.
2. Solve problems using the Pythagorean Theorem.
3. Determine trigonometric functions.
4. Interpret trigonometric tables.

5. Solve triangle problems using trigonometric functions.
6. Determine solutions of forces.
7. Determine areas of oblique triangles.

UNIT IV: Trigonometric Applications

Competencies:

1. Solve oblique triangle problems using laws of sine and cosine.
2. Determine areas of triangles.
3. Determine areas of polygons.
4. Solve radian measurement problems.
5. Solve radial velocity problems.
6. Calculate areas using double-meridian-distance (DMD) method.
7. Calculate areas using triangulation.
8. Calculate areas using coordinate method.
9. Measure magnitudes.
10. Measure angles as a variation in function.
11. Compute "X" and "Y" projections of a vector.

UNIT V: Systems of Linear Equations

Competencies:

1. Solve problems with 2 or 3 unknowns.
2. Solve problems with 3 or more unknowns.

UNIT VI: Exponents and Radicals

Competencies:

1. Explain laws of positive integral exponents.
2. Solve problems involving roots and radicals.
3. Solve radical problems.
4. Solve problems involving binomial expansion.

UNIT VII: Logarithms

Competencies:

1. Define logarithms.
2. Solve problems using logarithms.

UNIT VIII: Quadratic Equations

Competencies:

1. Solve quadratic equations with one unknown.
2. Explain literal quadratics.
3. Solve equations involving radicals.

UNIT IX: Vectors

Competencies:

1. Solve problems involving vector quantities.
2. Use graphical method to solve vector addition.
3. Solve problems in addition of vectors using trigonometric methods.
4. Solve problems using vector components.

UNIT X: Graphing the Trigonometric Functions

Competencies:

1. Construct graphs using the sine and cosine functions.
2. Solve problems using phase shift.
3. Construct composite curve graphs.

UNIT XI: Trigonometric Formulas and Identities

Competencies:
1. Solve problems using basic trigonometric identities.
2. Solve problems using sum and difference formulas.
3. Solve problems using double and half angle formulas.
4. Solve problems using trigonometric equations.
5. Solve problems using inverse trigonometric relations.
6. Solve problems using inverse trigonometric functions.

UNIT XII: Analytic Geometry

Competencies:
1. Solve problems involving the circle.
2. Solve problems involving the parabola.
3. Solve problems involving the ellipse.
4. Solve problems involving the hyperbola.
5. Solve problems involving translation of axis.
6. Solve problems involving the general second degree equation.
7. Solve problems involving systems with quadratic equations.

UNIT XIII: General Computational Methods

Competencies:
1. Determine coordinates of points located by right-angle offsets.
2. Determine coordinates of points on line.
3. Determine coordinates of points on a parallel line with a given offset distance.
4. Determine the distance of a point from a given line.

UNIT XIV: Intersections

Competencies:
1. Determine the point of intersection of two lines given two known points on each line.
2. Determine the point of intersection of two lines if each line passes through a known point and has a known direction.
3. Determine the point of intersection of two lines if each line passes through a known point and has a known length.
4. Calculate the point of intersection of two lines if one line passes through a known point and has a known direction and the other line passes through a known point and has a known length.

DRAFTING

Basic Drafting

UNIT I: Drafting Instruments, Equipment, and Materials

Competencies:
1. Identify and use drafting instruments.
2. Identify drawing leads.
3. Demonstrate ability to point leads.
4. Identify types and sizes of drawing media.
5. Identify and use equipment.
6. Identify and draw alphabet of lines.
7. Identify drawing formats.
8. Identify methods of reproduction.

UNIT II: Lettering

Competencies:
1. Draw guidelines.
2. Draw vertical and inclined single-stroke straight line Gothic letters, numerals, and fractions in both upper and lower case.
3. Letter notes and titles.

UNIT III: Geometric Construction

Competencies:
1. Identify terms and shapes.
2. Draw lines, angles, circles, and arcs.
3. Draw polygons, ellipses, and parabolas.

UNIT IV: Multiview Drawing

Competencies:
1. Identify fundamentals of orthographic projection.
2. Sketch orthographic views.
3. Select and project orthographic views.

UNIT V: Dimensioning

Competencies:
1. Identify terms associated with dimensioning.
2. Describe elements of dimensioning.
3. Discuss rules of dimensioning.
4. Apply dimensions to drawings.

UNIT VI: Pictorial Drawing

Competencies:
1. Construct isometric drawings.
2. Identify other types of pictorial drawings.

Survey Map Drafting

UNIT I: Control Traverses

Competencies:
1. Calculate bearings of lines of open traverses from field notes.
2. Plot open traverses from calculations.
3. Calculate and adjust lengths and bearings of the lines and the area of a closed traverse from field notes.
4. Plot closed traverse from calculations.
5. Plot traverse by coordinates.

UNIT II: Topographic Maps

Competencies:
1. Complete topographic map symbols plate.
2. Calculate bearings of a closed control traverse from field notes.
3. Plot closed control traverse.
4. Plot topographic details from field notes.
5. Complete planimetric map from field notes.

UNIT III: Profiles and Cross Sections

Competencies:
1. Complete plan-profile of proposed road plate from field notes.
2. Complete earthwork calculations from field notes.
3. Complete cross-section plate.

UNIT IV: Property Survey Maps

Competencies:
1. Describe plat construction.
2. Calculate lengths and bearings of property lines and enclosed area from field notes.
3. Complete plat of survey (property survey map).

UNIT V: Route Surveys

Competencies:
1. Explain procedure for horizontal curve design.
2. Calculate bearings of lines of open traverses from field notes.
3. Plot traverses.
4. Design and apply horizontal curves at all points of intersection (P.I.s) of traverses.

UNIT VI: Residential Subdivision Design

Competencies:
1. Calculate exterior boundaries (perimeter) of a tract of land from field notes.
2. Plot perimeter of a tract of land.
3. Design and plot all blocks, lots, streets, etc., to be included in subdivision which conform to all state, parish, and municipal codes.

Structural Drafting

UNIT I: Industrial Building Terms

Competencies:
1. Identify types of vessels.
2. Identify types of pumps and compressors.
3. Identify process plant terms.
4. Identify structural terms.
5. Identify concrete terms.

UNIT II: The Metric System

Competencies:
1. Explain the international metric system (SI).
2. Solve conversion problems.

UNIT III: Welding

Competencies:
1. Describe welding processes.
2. Identify welding types and symbols.
3. Describe purpose and types of weld testing.

UNIT IV: Structural Steel Drawings

Competencies:
1. Identify types of drawings.
2. Complete exercises on plant coordinate systems.
3. Draw civil drafting plates.
4. Identify structural steel shapes.
5. Draw structural steel shapes.
6. Describe structural steel designations, sizes, and dimensions.
7. Use structural steel tables.
8. Describe ladder and walkway drawings.
9. Make a structural steel arrangement drawing.
10. Describe bill of materials.
11. Make a bill of materials from structural drawing.
12. Make a bill of materials from a 4-pile structural steel jacket and deck section.

ENGLISH

UNIT I: Reading Improvement

Competencies:
1. Plan reading purpose.
2. Practice skim reading.
3. Practice scan reading.

4. Practice critical reading.
5. Practice intensive reading.
6. Perform tachistoscopic reading.
7. Perform controlled reading practice.

UNIT II: Reading Comprehension

Competencies:
1. Identify comprehension skills.
2. Interpret paragraph understanding.
3. Interpret sentence meaning.
4. Interpret word meaning through context.
5. Interpret word meaning through structure.
6. Organize paragraphs.
7. Perform outlining.

UNIT III: Technical Reports

Competencies:
1. Explain report writing.
2. Explain purpose statement.
3. Write short paragraphs containing purpose statements.
4. Read short articles and analyze content.
5. Plan a report.
6. Use reference sources.
7. Prepare bibliography cards.
8. Construct a written report.

UNIT IV: Oral Reports

Competencies:
1. Prepare oral reports.
2. Present oral reports.

UNIT V: Job Seeking Skills

Competencies:
1. Select means of locating job openings.
2. Prepare a resume'.
3. Prepare a personal portfolio.
4. Write a letter of application.
5. Complete an employment application.
6. Participate in a mock interview.
7. Write a follow-up letter.
8. Make a follow-up phone call.
9. Evaluate a job offer.
10. Compare job opportunities.

APPLIED PHYSICS

UNIT I: Properties of Matter

Competencies:
1. Explain structure of matter.
2. Explain states of matter.
3. Solve problems involving the states of matter.

UNIT II: Mechanics

Competencies:
1. Define force and motion.
2. Solve problems involving force and motion.
3. Define work, energy, and power.
4. Solve problems involving work, energy, and power.
5. Define vectors.

6. Solve vector problems using graphic solutions.
7. Describe analysis of basic machines.
8. Solve problems involving basic machines.
9. Describe rotation, torque, and power transmissions.
10. Solve problems involving rotation, torque, and power transmissions.

UNIT III: Heat

Competencies:
1. Describe temperature and the effects of heat.
2. Solve problems involving heat.
3. Describe heat and change of state of matter.
4. Solve problems involving heat and changes in state of matter.

UNIT IV: Sound

Competencies:
1. Describe wave motion and sound.
2. Solve wave motion and sound problems.
3. Describe technical applications of sound waves.
4. Solve problems involving technical applications of sound waves.

UNIT V: Light and Optics

Competencies:
1. Describe the nature of light and illumination.
2. Describe principles of optical instruments.

UNIT VI: Magnetism

Competencies:
1. Explain theory of magnetism.
2. Define lines of force.
3. Explain magnetic attraction.
4. Solve magnetism problems.

UNIT VII: Basic Electricity

Competencies:
1. Describe current flow.
2. Describe alternating current and direct current.
3. Explain how electricity is generated.
4. Explain how batteries work.
5. Explain sources and effects of electric current.
6. Solve problems involving basic electricity.

STATICS

UNIT I: Force Systems

Competencies:
1. Define forces.
2. Define coplanar parallel force systems.
3. Solve problems using coplanar parallel force systems.
4. Define coplanar concurrent force systems.
5. Solve problems using coplanar concurrent force systems.
6. Solve problems using graphing.
7. Define coplanar noncurrent force systems and solve reaction problems.
8. Define noncoplanar parallel force systems and solve reaction problems.

UNIT II: Centroids and Center of Gravity

Competencies:
1. Define centroids.
2. Find centroid of simple geometric areas and find centroid of composite areas.
3. Define center of gravity.
4. Find center of gravity of simple geometric shapes.

UNIT III: Moments of Inertia

Competencies:
1. Define moment of inertia of areas.
2. Determine moment of inertia of simple figures.
3. Determine moment of inertia of composite figures.
4. Define radius of gyration.

UNIT IV: Flexible Cables

Competencies:
1. Identify formulas.
2. Solve flexible cable problems.

STRENGTHS OF MATERIALS

UNIT I: Stress and Strain

Competencies:
1. Identify terms and definitions.
2. Define stress and strain.
3. Solve problems involving stress and strain.

UNIT II: Beams

Competencies:
1. Describe shear and moment diagrams.
2. Draw shear and moment diagrams.
3. Describe types of stresses in beams.
4. Solve beam stress problems.
5. Describe types of beam deflections.
6. Solve beam deflection problems.

UNIT III: Beam Connections

Competencies:
1. Describe types of beam connections.
2. Solve beam connection problems.

UNIT IV: Columns

Competencies:
1. Describe types of columns.
2. Solve column problems.

CONCRETE

UNIT I: Introduction to Portland Cement Concrete

Competencies:
1. Describe history of Portland cement.
2. Explain composition and manufacture of Portland cement.
3. Describe admixtures.
4. Identify terms and definitions.
5. Describe proper handling and storage of materials.
6. Determine unit weight, specific gravity, and absorption of coarse aggregates.

UNIT II: Sampling Materials

Competencies:

1. Identify types of aggregates.
2. Collect aggregate samples.
3. Describe cement.
4. Collect cement samples.
5. Describe water and admixtures for concrete.
6. Collect water and admixture samples.
7. Describe types of concrete.
8. Collect fresh concrete sample.
9. Identify sampling forms.
10. Prepare aggregate test reports.
11. Complete sample identification forms.

UNIT III: Testing

Competencies:

1. Explain how to calibrate laboratory scales.
2. Calibrate gram and pound scales.
3. Explain how to reduce the size of a sample.
4. Reduce the size of sample using sample splitter.
5. Reduce the size of sample using hand quartering methods.
6. Explain how to test for moisture.
7. Determine total and free moisture in sand and gravel sample.
8. Explain gradation testing.
9. Perform sieve analysis on fine aggregate.
10. Perform sieve analysis on coarse aggregate.
11. Perform random sample test.
12. Perform aggregate sample test and record on aggregate control chart.
13. Explain purpose of slump test.
14. Perform slump test on concrete.
15. Explain purpose of air test.
16. Perform air test on concrete using volumetric method.
17. Explain purpose of concrete compression test.
18. Run 7-day and 28-day compression test on concrete cylinders.

UNIT IV: Mix Design

Competencies:

1. Describe job mix release.
2. Complete a job mix release form.
3. Design a concrete mix using absolute volume method.
4. Explain how to adjust the mix.
5. Determine moisture adjustment for concrete mix.
6. Design a concrete mix and perform control tests.
7. Explain how to adjust the slump.
8. Explain importance of temperature control.
9. Describe theoretical yield and weight-volume relationships.
10. Solve problems on yield and weight-volume relationships.
11. Explain actual yield check.
12. Solve actual yield problems.
13. Solve problems for air content using master proportion table.

UNIT V: Portland Cement Concrete Plants

Competencies:

1. Explain dry batch plant inspection.
2. Explain transit mix plant inspection.
3. Explain central mix plant inspection.

UNIT VI: Contractor Quality Control Specifications

Competencies:
1. Explain plant certification.
2. Describe a plant laboratory.
3. Identify types and use of trucks.
4. Describe job mix materials and designing.
5. Describe job mix release submittal.
6. Describe batch weights.
7. Explain importance of quality control.

UNIT VII: Louisiana Quality Control Specifications

Competencies:
1. Explain function of quality control personnel.
2. Describe plant facilities.
3. Identify types and use of trucks.
4. Explain mix release approval.
5. Explain batch weights approval.
6. Explain concrete mix inspection.
7. Describe concrete pavement and approach slabs.
8. Describe structural concrete.
9. Describe concrete for minor structures.

ASPHALTIC CONCRETE

UNIT I: Introduction to Asphaltic Concrete

Competencies:
1. Describe hot mix.
2. Describe methods of testing.
3. Determine the viscosity and penetration of an asphaltic cement sample.
4. Solve problems of job mix formulas.
5. Perform gradation test.
6. Describe hot mix plants.

UNIT II: Sampling Materials

Competencies:
1. Describe sample techniques.
2. Obtain aggregate samples for blending.
3. Solve problems on aggregate blending.
4. Blend three aggregates for a Type I wearing coarse mix.
5. Describe sampling of mineral filler.
6. Describe sampling of asphalt cement.
7. Describe sampling of fuel oil.

UNIT III: Plant Inspection

Competencies:
1. Identify types of crushers.
2. Describe cold feed.
3. Describe dryer and dust collector.
4. Describe batch tower.
5. Describe batching operation.
6. Explain use of weights and scales.
7. Explain use of teleprinter.
8. Describe contractor and Louisiana Department of Transportation and Development responsibilities.
9. Describe finished hot mix.
10. Describe functions of a laboratory.
11. Solve problem on Marshall test properties.
12. Make and test a briquette.

13. Perform a centrifuge extraction test.
14. Perform a gradation on aggregate and determine the percentage of crushed particles.
15. Perform a reflux extraction test.
16. Perform roadway density tests on briquette cores.
17. Complete daily asphalt work sheet.
18. Perform comprehensive tests on hot mix samples.

UNIT IV: Advanced Plant Inspection

Competencies:

1. Describe materials.
2. Describe mixes.
3. Describe quality control and acceptance.
4. Describe design of mixtures.
5. Solve problems on Marshall method of mix design.
6. Describe type of plants.
7. Describe documentation.

UNIT V: Quality Control Specifications

Competencies:

1. Describe contractor's duties and responsibilities.
2. Describe Louisiana Department of Transportation and Development duties and responsibilities.
3. Identify tables and schedules.

SOIL MECHANICS

UNIT I: Soil Deposits

Competencies:

1. Identify types of rocks.
2. Identify types of soil.
3. Describe effect of soil on design and construction.

UNIT II: Soil Composition

Competencies:

1. Describe soil systems and mass.
2. Describe major soil types.
3. Describe soil structure.

UNIT III: Soil Classification

Competencies:

1. Describe soil classification tests.
2. Determine Atterberg limits.
3. Perform soil moisture and density tests.
4. Perform soil moisture and density test using family of curves.
5. Determine the in-place density using the sand cone method.
6. Describe soil classification systems.
7. Classify soil by mechanical analysis using the triangular and the American Association of State Highway and Transportation Officials (AASHTO) classification systems.
8. Classify soils using the unified and AASHTO classification systems.

UNIT IV: Site Investigation

Competencies:

1. Describe maps and aerial photographs used for site investigation.
2. Describe boring and test pits.
3. Plot a soil profile from a boring log.
4. Perform a complete laboratory analysis on a soil sample.
5. Describe geophysical methods of site investigation.
6. Describe in-place testing.

7. Use sand cone method of testing.
8. Observe nuclear density test.

UNIT V: Earth Moving

Competencies:
1. Identify types of earth moving equipment.
2. Identify compaction equipment.
3. Describe test method used to establish soil density and field density.
4. Describe soil stabilization.

UNIT VI: Foundations

Competencies:
1. Describe general types of foundations.
2. Describe pile foundation types and installation.

SANITARY ENGINEERING

UNIT I: Communicable Diseases

Competencies:
1. Describe communicable diseases.
2. Explain general control of communicable diseases.

UNIT II: General Characteristics, Treatments, and Protection of Water

Competencies:
1. Identify water-borne impurities and diseases.
2. Describe examination and treatment of water.
3. Describe water storage reservoirs.
4. Identify individual wells.

UNIT III.: Air Pollution and Its Control

Competencies:
1. Define air pollution.
2. Classify pollutants.
3. Describe interaction products.
4. Explain atmospheric pollution and effects on health.
5. Describe prevention and control of pollution.

UNIT IV: Treatment and Disposal of Human Waste

Competencies:
1. Discuss environmental health problems.
2. Describe characteristics of excreta and sewage.
3. Explain bacteriology of sewage and stabilization.
4. Explain effects of soil characteristics on waste disposal.
5. Describe types of individual sewage disposal systems.
6. Describe municipal sewage treatment and disposal.
7. Identify industrial wastes.
8. Explain disposal without water carriage.

BASIC PROGRAMMING

UNIT I: Introduction

Competencies:
1. Identify terms and definitions.
2. Identify types of computers.
3. Identify keyboard functions.
4. Identify data input and output processing units.

5. Describe computer programs.
6. Identify components of a microcomputer system.
7. Perform start-up procedures.
8. Load the BASIC interpreter.
9. Load a sample BASIC program.
10. Save a BASIC program.
11. Run a sample BASIC program.
12. Execute sign-off procedure.

UNIT II: Input/Output

Competencies:

1. Describe input programming.
2. Perform input programming.
3. Describe output programming.
4. Perform output programming.

UNIT III: Arithmetic Operations

Competencies:

1. Code BASIC statements using addition, subtraction, multiplication, and division.
2. Code BASIC statements involving exponentiation, hierarchy of operations, multiple operations, and use of parentheses.

UNIT IV: Decision Making

Competencies:

1. Describe the decision-making logic structures.
2. Identify forms of the IF-THEN-ELSE structure.
3. Describe relational operators.
4. Compare numeric values.
5. Compare string values.
6. Write various forms of the IF-THEN-ELSE statements.
7. Construct meaningful statements implementing the LOGICAL operations.
8. Construct nested IF-THEN-ELSE structures.

UNIT V: Interactive Programming

Competencies:

1. Construct input/output statements with prompts.
2. Construct interactive loops.
3. Construct interactive program segments.

UNIT VI: Arrays

Competencies:

1. Create and load a simple array.
2. Code a multi-dimension array.
3. Code various array search methods.

UNIT VII: Subroutines

Competencies:

1. Describe subroutine structures.
2. Write code for subroutine program.

UNIT VIII: Files

Competencies:

1. Describe file specifications.
2. Describe the open statement.
3. Create a sequential file.
4. Create a random file.
5. Write data to disk.
6. Read data from a disk file.

LEGAL PRINCIPLES OF SURVEYING

UNIT I: Systems Used to Describe Land

Competencies:
1. Explain systems used to describe land.
2. Describe subdivisions.
3. Describe sectionalized land surveys.

UNIT II: Transfer of Real Property

Competencies:
1. Define real property.
2. Describe written transfers of real property.
3. Describe transfers not in writing.

UNIT III: Ownership and Land Location

Competencies:
1. Describe ownership and possession.
2. Describe senior rights and simultaneous rights.
3. Describe original surveys and resurveys.
4. Describe measurement errors on resurveys.
5. Describe positions without error.
6. Describe land movement.

UNIT IV: Locating Sequence Conveyances

Competencies:
1. Explain order of importance of conflicting title elements.
2. Explain basis of bearings.

UNIT V: Simultaneous Conveyances Created by State Law

Competencies:
1. Describe establishment of subdivision boundaries and corners.
2. Describe control of conflicting elements within a subdivision.
3. Describe establishment of street or block corners.
4. Describe establishment of lots within subdivisions.
5. Describe establishing lots adjoining subdivision boundaries.

UNIT VI: Combinations of Sequence and Simultaneous Conveyances

Competencies:
1. Explain "of record" descriptions.
2. Explain overlaps and gaps.
3. Describe roads as boundaries and road descriptions.
4. Explain proceedings in partition.

UNIT VII: Locating Reversion Rights

Competency: Explain apportionment of reversion rights.

UNIT VIII: Riparian and Littoral Owners

Competencies:
1. Describe riparian rights.
2. Define terms.
3. Describe conditions of navigability.
4. Describe tides and sea level.
5. Describe tidelands.
6. Describe reach of tidal waters.
7. Describe submerged lands.
8. Explain ownership of the beds of nonnavigable, nontidal waters.
9. Explain ownership of tidelands.
10. Describe swamp and overflowed land.
11. Describe a salt marsh.

12. Explain ownership of interior submerged lands.
13. Explain ownership of offshore submerged lands.
14. Describe boundary line shifts with naturally changing water line.
15. Explain ownership of land built up by accretion.
16. Explain ownership of land lost by natural erosion or inundation.
17. Explain ownership of river bank removed by avulsion.
18. Describe effect upon boundary by man-caused shoreline changes.
19. Explain ownership of islands.
20. Describe land lost by erosion and regained by accretion.
21. Describe methods of apportioning ownership of alluvium between adjoining owners.
22. Explain tide and submerged land ownership with nonchanging boundaries.
23. Describe distribution of land between meander line and water line.
24. Explain ownership between states.
25. Describe control of navigation.
26. Describe fraudulent surveys and erroneously omitted areas.
27. Interpret deeds with respect to ownership of the bed of waters.
28. Explain double descriptions.
29. Describe changing conditions.
30. Explain effect of change in jurisdiction on accretion rule.
31. Explain loss of riparian rights and compensation.
32. Explain Submerged Lands Act.

LOUISIANA SURVEY LAW

UNIT I: Louisiana Civil Code

Competencies:
1. Explain the right of accession.
2. Explain the right of passage and of way.
3. Explain servitudes.
4. Explain surveying and fixing land boundaries.
5. Explain possession.
6. Explain prescription.
7. Explain rules as to form.

UNIT II: Louisiana Code of Civil Procedure

Competencies:
1. Describe court appointed experts.
2. Explain petitory action.
3. Explain possessory action.
4. Explain sequestration.
5. Explain boundary action and partition.

UNIT III: Louisiana Revised Statutes

Competencies:
1. Discuss annexation and statutory dedication.
2. Describe regulatory statutes concerning the practice of surveying by engineers and surveyors.
3. Describe public lands.
4. Explain how boundaries are determined where the state of Louisiana is a party.
5. Identify parish and local roads and right-of-way.
6. Identify state water boundaries.
7. Describe Louisiana coordinate system.
8. Discuss entry on and injury to land.
9. Describe state and parish surveys and parish boundaries.

UNIT IV: United States Code (USC) Title 43

Competencies:
1. Discuss Bureau of Land Management.
2. Describe rights-of-way and other easements in public lands.
3. Discuss grants of swamp and overflowed lands.
4. Identify submerged lands.
5. Discuss lands beneath navigable waters within state boundaries.
6. Discuss outer continental shelf lands.

UNITED STATES PUBLIC LAND SURVEYS

UNIT I: The General Plan

Competencies:
1. Describe public lands.
2. Explain laws relating to surveys.
3. Describe the general rules for surveys.
4. Describe the organization of surveys.
5. Identify the public land states.

UNIT II: The System of Rectangular Surveys

Competencies:
1. Explain the general scheme of rectangular surveys.
2. Describe initial points.
3. Describe the principal meridian.
4. Describe the base line.
5. Describe standard parallels.
6. Describe guide meridians.
7. Describe township exteriors.
8. Describe subdivision of townships.
9. Describe subdivision of sections.
10. Describe survey of parts of sections.
11. Describe fractional townships.
12. Describe extension and completion surveys.
13. Describe meandering.
14. Describe limits of closure.
15. Describe marking lines between corners.
16. Describe summary of objects noted and sketches.

UNIT III: Monumentation

Competencies:
1. Describe legal significance of the monument.
2. Describe general requirements of a monument.
3. Describe corner material.
4. Describe construction of monuments.
5. Describe special-purpose monuments.
6. Describe system of marking.
7. Identify marks on corner monuments.
8. Identify marks on special-purpose monuments.
9. Describe corner accessories.
10. Describe arrangement and marking of corner accessories.
11. Describe restoration of lost or obliterated corners.

UNIT IV: Resurveys

Competencies:
1. Explain the nature of resurveys.
2. Explain jurisdiction.

3. Explain limit of authority of surveyor.
4. Explain bona fide rights of claimants.
5. Describe general field methods.
6. Describe the dependent resurvey.
7. Describe the independent resurvey.

UNIT V: Special Surveys and Instructions

Competencies:
1. Describe special instructions.
2. Describe special surveys.
3. Describe special surveys with water boundaries.
4. Describe swamp and overflowed lands surveys.
5. Explain soil classification.

UNIT VI: Field Notes

Competencies:
1. Explain purpose and style of field notes.
2. Describe titles.
3. Describe index.
4. Describe headings.
5. Identify abbreviations.
6. Describe the detailed field-note record.
7. Describe specimen field notes.

UNIT VII: Plats

Competencies:
1. Explain the importance of the plat.
2. Explain plat requirements.
3. Explain specimen township plat.
4. Describe drafting the base drawing.
5. Explain computation of areas.
6. Describe how to ink the drawing.
7. Describe type of lettering used on plats.
8. Describe topography.
9. Describe field sketches.
10. Describe titles and subtitles.
11. Explain certificates.
12. Describe reproduction and distribution of plats.
13. Describe supplemental plats.
14. Describe plats of mineral segregation surveys.
15. Describe plats of fragmentary surveys.
16. Describe resurvey plats.

MAP STUDY AND HIGHWAY PLAN READING

UNIT I: Introduction to Maps

Competencies:
1. Identify map sources.
2. Describe map construction.
3. Identify types of cartographers.
4. Discuss history of maps.
5. Explain antiquity.
6. Identify classes of maps.

UNIT II: Introduction to Air Photos

Competencies:

1. Identify types of air photos.
2. Identify clues for air photo reading.
3. Examine air photos with stereoscope.
4. Explain parallax.

UNIT III: Principles of Map Making

Competencies:

1. Compare maps and photographs.
2. Make map and photo comparisons.
3. Describe map characteristics.
4. Identify map scales.

UNIT IV: Relief Methods

Competencies:

1. Describe contours.
2. Describe colors and shades.

UNIT V: Government Maps

Competencies:

1. Identify government department maps.
2. Complete examination projects using various types of government maps.

UNIT VI: Topographic Maps

Competencies:

1. Identify topographic map symbols.
2. Explain location of topographic features.
3. Locate parcels of land and features on United States geological survey quadrangle maps.

UNIT VII: Preliminary Map Measurement

Competencies:

1. Discuss factors of map scale.
2. Describe compensating polar planimeter.
3. Complete area determination projects by use of polar planimeter.
4. Describe plan measure (cartometer).
5. Complete map feature measurement projects by use of cartometer.

UNIT VIII: Map Projections and Grid Systems

Competencies:

1. Make globe and map comparison.
2. Identify projection terms.
3. Discuss construction and classification of projections.
4. Explain Louisiana's grid system.

UNIT IX: Navigation Charts

Competencies:

1. Complete land chart projects.
2. Complete water chart projects.
3. Complete air chart projects.

UNIT X: The Earth and Globes

Competencies:

1. Discuss size and shape of the Earth.
2. Describe other characteristics of the Earth.
3. Describe parallels and meridians.
4. Describe hemispheres.
5. Discuss early globes.
6. Describe globe types and uses

UNIT XI: Highway Plan Reading

Competencies:

1. Describe a construction contract.
2. Read and interpret title sheets.
3. Read and interpret right-of-way sheets.
4. Read and interpret plan and profile sheets.
5. Read and interpret cross-section sheets.
6. Read and interpret typical sections and detail sheets.
7. Read and interpret special detail sheets.
8. Read and interpret drainage layout map sheets.
9. Read and interpret subgrade soil survey sheets.
10. Read and interpret standard plan sheets.
11. Read and interpret bridge plan sheets.
12. Read and interpret summary sheets.
13. Read and interpret a complete set of plans.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Engineering **Course Title:** Drafting and Design Technology

CIP Code: 15.0202 **Course Length** 2700 Clock Hours - 24 Months

Course Description:

The purpose of this course is to prepare individuals to assist engineers and architects in the design and drafting of electrical circuits, maps, machines, structures, and fluid systems. This includes preparation of engineering and architectural plans, layouts, detailed drawings, charts, graphs, diagrams, and the use of handbooks and reference materials.

The Drafting course is divided into three distinct phases. The first phase, Basic Drafting, provides students with fundamental drafting skills both on the drawing board and on the computer. The second phase, Intermediate Drafting, introduces students to several specialized drafting disciplines and advanced computer drafting applications. In the third phase, Specialized Drafting, a student selects one of the drafting disciplines for an area of specialization. The remainder of the course is devoted to intensive training in this area of specialization.

The course content is organized into competency-based units of instruction that specify occupational competencies which the student must successfully complete.

Units of Instruction:

Basic Drafting

I. Orientation
II. Instruments, Equipment and Materials
III. Lettering
IV. Geometric Construction
V. Orthographic Projection and Sketching
VI. Pictorial Drawing
VII. Dimensioning
VIII. Sectional Views
IX. Auxiliary Views and Descriptive Geometry
X. Intersections and Developments
XI. Fasteners
XII. Introduction to Working Drawings
XIII. Applied Drafting Mathematics
XIV. Technical Writing
XV. Introduction to Computer Aided Drafting (CAD)

Intermediate Drafting

I. Manufacturing Drafting
II. Civil/Map Drafting
III. Architectural Drafting
IV. Structural Drafting
V. Electrical Systems Drafting
VI. Piping Drafting
VII. Marine Drafting
VIII. Advanced Computer Aided Drafting Applications

Specialized Drafting

Manufacturing Drafting
Civil/Map Drafting
Architectural Drafting
Structural Drafting
Electrical Systems Drafting
Piping Drafting
Marine Drafting

Curriculum Competency Outline

BASIC DRAFTING

UNIT I: Orientation

Competencies:

1. Identify terms associated with drafting.
2. Identify areas of specialization.
3. Identify school and classroom safety rules.
4. Identify places of employment.
5. Discuss dress and attitudes.
6. Discuss history and purpose of drafting.
7. Practice visualizing objects.
8. Describe computer aided drafting.

UNIT II: Instruments, Equipment and Materials

Competencies:

1. Identify and use drafting instruments.
2. Identify drawing leads.
3. Demonstrate ability to point leads.
4. Identify types and sizes of drawing media.
5. Identify and use equipment.
6. Identify and draw alphabet of lines
7. Identify drawing formats.
8. Identify methods of reproduction.
9. Identify CAD equipment.

UNIT III: Lettering

Competencies:

1. Draw guidelines.
2. Draw vertical and inclined single-stroke straight line gothic letters, numerals, and fractions in both upper and lower case.
3. Letter notes and titles.
4. Identify and use lettering devices.
5. Identify miscellaneous lettering styles.

UNIT IV: Geometric Construction

Competencies:

1. Identify geometric terms and shapes.
2. Draw lines, angles, circles and arcs.
3. Draw polygons, ellipses, and parabolas.
4. Apply geometric construction to a single-view drawing.

UNIT V: Orthographic Projection and Sketching

Competencies:

1. Identify fundamentals of orthographic projection.
2. Sketch orthographic views.
3. Select and project orthographic views.
4. Prepare a formal orthographic drawing.

UNIT VI: Pictorial Drawing

Competencies:

1. Make isometric drawings.
2. Make oblique drawings.
3. Identify other types of pictorial drawings.

UNIT VII: Dimensioning

Competencies:
1. Identify terms associated with dimensioning.
2. Describe elements of dimensioning.
3. Discuss rules of dimensioning.
4. Apply dimensions to object drawings.
5. Identify terms associated with precision dimensions and tolerances.

UNIT VIII: Sectional Views

Competencies:
1. Identify section conventions.
2. Draw full sections.
3. Draw half sections.
4. Draw offset sections.
5. Draw broken-out sections.
6. Draw revolved sections.
7. Draw removed sections.
8. Draw sections of objects with webs, ribs, and spokes.

UNIT IX: Auxiliary Views and Descriptive Geometry

Competencies:
1. Identify terms.
2. Identify views.
3. Draw primary auxiliary views.
4. Draw secondary auxiliary views.
5. Construct and identify points, lines, and planes in space.
6. Determine true lengths of lines.
7. Determine true distance between lines.
8. Determine true size of angles and surfaces.

UNIT X: Intersections and Developments

Competencies:
1. Construct flat pattern developments of cylinders.
2. Construct flat pattern developments of cones.
3. Construct flat pattern developments of prisms.
4. Construct flat pattern developments of pyramids.
5. Construct flat pattern developments of a sphere.
6. Determine bend allowance for sheet metal parts.
7. Determine lines of intersection for various shaped objects.
8. Construct flat pattern developments of intersecting objects.

UNIT XI: Fasteners

Competencies:
1. Identify types of fastening devices and their designations.
2. Draw various types of detail threads.
3. Draw simplified threads.
4. Draw schematic threads.
5. Identify types of springs.
6. Draw detail of extension springs.
7. Draw detail of compression springs.
8. Draw detail of torsion springs.

UNIT XII: Introduction to Working Drawings

Competencies:
1. Identify types of working drawings.
2. Describe a layout drawing.
3. Describe a detail drawing.

4. Describe a subassembly drawing.
5. Describe an assembly drawing.
6. Describe a process drawing.
7. Describe a schematic drawing.
8. Describe a patent drawing.
9. Develop a working drawing format.
10. Draw graphs and charts.
11. Prepare schedules.
12. Apply inking techniques.
13. Prepare a complete working drawing.
14. Check working drawings.

UNIT XIII: Applied Drafting Mathematics

Competencies:

1. Add, subtract, multiply and divide common fractions.
2. Add, subtract, multiply and divide decimal fractions.
3. Convert common fractions to decimal fractions.
4. Convert decimal fractions to common fractions.
5. Convert customary measures to metric measures and imperial measures.
6. Calculate areas and volumes.
7. Calculate offsets and true length lines.
8. Determine angles in degrees and radians.
9. Calculate lengths of arcs.
10. Calculate lengths of chords.
11. Calculate circular segments.
12. Solve right triangle problems using trigonometric functions.
13. Solve triangle problems using law of sines.
14. Solve triangle problems using law of cosines.

UNIT XIV: Technical Writing

Competencies:

1. Prepare a business letter.
2. Prepare a revision (change order).
3. Prepare a schedule.
4. Prepare a progress report.
5. Prepare a bid document.
6. Prepare an acceptance report.
7. Prepare various types of manuals.

UNIT XV: Introduction to Basic Computer Aided Drafting (CAD)

Competencies:

1. Identify tools.
2. Identify types of hardware.
3. Identify types of software.
4. Identify terms associated with CAD.
5. Identify types of computer languages.
6. Identify methods of saving and recovering files.
7. Identify methods used to select commands on a CAD system for drawing setup and control.
8. Use devices to make a menu selection.
9. Construct a full-scale elementary primitive.
10. Generate a part.
11. Identify applications of special functions.
12. Identify layering, conventions, and concepts.
13. Perform view manipulations.

14. Perform modifications.
15. Perform entity manipulations.
16. Apply text commands for general text and attribute or property text.
17. Perform editing by delete, undelete, change and add fillets, rounds and chamfers.
18. Apply dimensions.
19. Edit dimensions.
20. Apply drawing annotations.
21. Identify plotting equipment.
22. Set up plotting equipment.
23. Plot a drawing.

INTERMEDIATE DRAFTING

UNIT I: Manufacturing Drafting

Competencies:

1. Describe purpose of machine drafting.
2. Identify terms and symbols.
3. Identify various types of drawings.
4. Describe precision dimensions and identify symbols.
5. Draw a simple machined part.
6. Make a simple forging drawing.
7. Make a simple casting drawing.
8. Make a simple weldment drawing.
9. Make an assembly drawing of a piece of mechanical equipment.

UNIT II: Civil/Map Drafting

Competencies:

1. Describe purpose of civil/map drafting.
2. Identify terms and symbols.
3. Identify types of lettering.
4. Identify dimensioning techniques.
5. Identify types of lines.
6. Identify types of surface and subsurface maps.
7. Explain and interpret field notes.
8. Draw various types of simple maps.

UNIT III: Architectural Drafting

Competencies:

1. Describe the history and purpose of architectural drafting.
2. Identify terms, symbols, and codes.
3. Identify types of lettering.
4. Identify dimensioning techniques.
5. Identify common construction materials.
6. Identify drawing scales.
7. Use architect's scale.
8. Draw details and sections.
9. Draw elevation views.

UNIT IV: Structural Drafting

Competencies:

1. Describe purpose of structural drafting.
2. Identify terms, symbols, and codes.
3. Identify structural shapes and materials.
4. Identify types of drawings.
5. Draw a simple erection plan.
6. Draw structural details of a small building.
7. Draw foundation plan and details of a small building.

UNIT V: Electrical Systems Drafting

Competencies:
1. Describe purpose of electrical/electronic drafting.
2. Identify terms, symbols, and codes.
3. Identify types of electrical circuits.
4. Identify types of drawings.
5. Draw electrical plan for a small building.
6. Draw a simple electronic schematic.

UNIT VI: Piping Drafting

Competencies:
1. Describe purpose of piping/instrumentation drafting.
2. Identify terms, symbols, specifications, and codes.
3. Identify types of drawings.
4. Draw a simple flow diagram.
5. Draw a piping plan and elevation views.
6. Draw piping isometric views.
7. Draw piping spools.

UNIT VII: Marine Drafting

Competencies:
1. Identify purpose of marine drafting.
2. Identify types of marine vessels and structures.
3. Identify terms, symbols, and codes.
4. Identify types of drawings.
5. Describe vessel nomenclature.
6. Draw lines and offsets.
7. Prepare profile and general arrangement drawings.

UNIT VIII: Advanced Computer Aided Drafting Applications

Competencies:
1. Identify software available for drafting specialties.
2. Perform system interfacing.
3. Create symbols and develop a library.
4. Apply efficient drawing techniques.
5. Describe operation of system text editor.
6. Perform macro programming using graphic command chaining.
7. Explain and apply programming concepts.
8. Describe and apply three-dimensional applications.

SPECIALIZED DRAFTING

MANUFACTURING DRAFTING

UNIT I: Orientation

Competencies:

1. Identify terms and definitions.
2. Describe areas of specialization.
3. Identify industries that employ mechanical drafters.
4. Describe job titles and descriptions.
5. Describe steps in mechanical design and drafting work.
6. Describe duties of a manufacturing drafter.
7. Describe job classifications.
8. Describe related occupations.
9. Explain advantages and disadvantages of a mechanical drafting occupation.
10. Describe minimum qualifications.
11. Describe personality traits of a drafter.
12. Describe related skills for a drafter.
13. Identify abbreviations.
14. Describe professional organizations.

UNIT II: Materials and Specifications

Competencies:

1. Identify terms and definitions.
2. Describe specifications found on manufacturing drawings.
3. Explain heat treatments for metals.
4. Explain surface hardening treatments for metals.
5. Describe forms of carbon steel.
6. Identify categories of pipe.
7. Select specifications for tubing callouts.
8. Select specifications for structural steel shapes.
9. Identify standard mill forms of materials.
10. Describe metal properties.
11. Describe factors to consider in selecting materials.
12. Identify types and kinds of ferrous manufacturing metals.
13. Identify parts of the steel numbering system.
14. Identify types and kinds of nonferrous metals.
15. Identify types of plastic materials.
16. Identify refractory materials.
17. Determine wire and sheet metal size from gage number.
18. Select materials from a materials stock book.

UNIT III: Manufacturing Processes

Competencies:

1. Identify terms and definitions.
2. Describe welding processes.
3. Describe machining processes.
4. Describe casting processes.
5. Describe forging processes.
6. Describe extruding processes.
7. Describe forming processes.
8. Describe molding processes.
9. Describe powder metallurgy processes.
10. Explain quality control methods.

11. Describe types of drawings.
12. Describe heat treatment of metals.
13. Describe computer automated manufacturing (CAM).

UNIT IV: Tools and Equipment

Competencies:
1. Identify terms and definitions.
2. Identify mechanical templates.
3. Identify precision measuring instruments.
4. Identify types of scales.
5. Read micrometer settings.
6. Read vernier calipers.
7. Measure with scales.
8. Use a micrometer.
9. Use a vernier caliper.

UNIT V: Reference Materials

Competencies:
1. Identify terms and definitions.
2. Use product information literature.
3. Use mechanical standards references.
4. Use handbooks.
5. Interpret ANSI standards.
6. Determine manufacturer of mechanical components from *Thomas Register*.

UNIT VI: Dimensioning and Tolerancing

Competencies:
1. Identify terms and definitions.
2. Describe size and location dimensions for a geometric shape.
3. Describe mating dimensions in an assembly drawing.
4. Describe numerical control dimensioning.
5. Identify fits for inch and metric units.
6. Describe limits in inch units using basic hole system.
7. Describe limits in metric units using basic hole system.
8. Describe tolerance ranges for shop processes.
9. Describe hole size limits for standard dowels.
10. Describe limit dimensions for interchangeability of parts.
11. Describe limit dimensions for intermediate parts.
12. Identify symbols for tolerance and form.
13. Identify symbols for position and form.
14. Describe positional tolerancing.
15. Describe angular tolerances.
16. Interpret surface quality specifications.
17. Identify surface quality symbols.
18. Describe surface quality notes.
19. Identify lay symbols.
20. Dimension an object completely.
21. Calculate and dimension clearance fit tolerances using standard fit tables.
22. Calculate and dimension interference fit tolerances using standard fit tables.
23. Calculate and assign tolerances to mating parts using standard fit tables.
24. Calculate and dimension hole size limits for standard dowels.
25. Dimension an object using position and form tolerances.
26. Determine ranges of motion of limbs and spaces required for a person.

UNIT VII: Fasteners and Hardware

Competencies:

1. Identify terms and definitions.
2. Identify types of fasteners.
3. Describe applications of screw threads.
4. Describe screw threads nomenclature.
5. Identify screw thread profiles.
6. Describe lead of thread.
7. Identify screw thread symbols.
8. Identify classes of fit for unified threads.
9. Identify classes of fit for metric threads.
10. Identify parts of thread notes.
11. Identify conventional representations of pipe threads.
12. Describe types of threaded removable fasteners.
13. Identify shapes of bolts and nuts.
14. Identify types of locknuts and locking devices.
15. Identify types of standard cap screws.
16. Identify types of machine screws.
17. Identify set screw heads and points.
18. Identify miscellaneous bolts and screws.
19. Identify standard large and small rivets.
20. Identify rivet symbols.
21. Describe advantages of plastic fasteners over metal fasteners.
22. Identify devices to lock components on a shaft.
23. Identify types of springs.
24. Identify types of spring clips.
25. Identify types of keys.
26. Identify types of machine pins.
27. Identify washers.
28. Describe applications of inserts.
29. Identify types of lock washers.
30. Describe uses for spring washer designs.
31. Identify quick opening and locking devices.
32. Identify miscellaneous machine elements.
33. Describe advantages of different fasteners.
34. Identify types of welded joints.
35. Identify parts of a welding symbol.
36. Identify basic arc and gas weld symbols.
37. Identify supplementary welding symbols.
38. Describe welding dimensions for a fillet weld.
39. Identify resistance welding symbols.
40. Describe using adhesives for bonding material.
41. Describe joint design considerations for adhesive bonding.
42. Construct thread symbols.
43. Construct bolts, screws, and nuts.
44. Construct an assembly containing various fasteners.
45. Apply symbols to a welded assembly drawing.
46. Construct spring drawings to include specifications.
47. Construct keys in assembled positions.

UNIT VIII: Layouts and Working Drawings

Competencies:

1. Identify terms and definitions.
2. Describe information on title blocks.
3. Describe information on revision blocks.
4. Describe information on a bill of materials/parts list.

5. Describe design layouts.
6. Describe parts of detail drawing.
7. Describe parts of assembly drawing.
8. Describe information found on outline or installation assemblies.
9. Describe information found on welding assembly drawings.
10. Describe characteristics of forging drawings.
11. Describe information found on a pattern or casting drawing.
12. Make a design layout.
13. Make a machining drawing.
14. Make a casting drawing.
15. Make a forging drawing.
16. Make a welding drawing.
17. Make a tabular drawing.
18. Make an assembly drawing.
19. Complete a title block and revision block.
20. Complete a parts list.

UNIT IX: Presentation Drawings

Competencies:
1. Identify terms and definitions.
2. Identify types of presentation sketches.
3. Describe steps of sketching.
4. Identify shading techniques.
5. Identify types of axonometric drawings.
6. Describe oblique drawings.
7. Describe an exploded assembly drawing.
8. Describe special requirements for patent drawings.
9. Make an isometric drawing.
10. Make an oblique drawing.
11. Make an isometric assembly drawing.
12. Shade pictorial drawings.
13. Make an exploded assembly drawing.
14. Make a patent drawing.

UNIT X: Power Transmission

Competencies:
1. Identify terms and definitions.
2. Describe advantages of chain drives, gear drives, and belt drives.
3. Describe steps for selecting a V-belt drive.
4. Identify types of power transmission chains.
5. Identify types of gears.
6. Identify parts of gear teeth.
7. Calculate cutting data needed for spur gear drawings.
8. Identify parts of a bevel gear.
9. Calculate cutting data needed for bevel gears.
10. Calculate cutting data needed for worm and worm wheel.
11. Identify types of couplings.
12. Identify types of bearings.
13. Describe cam nomenclature.
14. Identify types of cam followers.
15. Describe types of cam motions.
16. Identify hydraulic components.
17. Identify pneumatic components.
18. Construct a hydraulic schematic.
19. Construct a spur gear drawing.
20. Construct a bevel gear drawing.
21. Construct a worm and worm gear drawing.

22. Calculate gear ratios.
23. Determine gear rotation.
24. Calculate gear speeds.
25. Construct a cam drawing.
26. Select a chain drive.
27. Select a V-belt drive.
28. Select types of bearings from handbooks.

UNIT XI: Job Seeking Skills

Competencies:
1. Select means of locating job openings.
2. Prepare a resume'.
3. Prepare a personal portfolio.
4. Write a letter of application.
5. Complete an employment application.
6. Participate in a mock interview.
7. Write a follow-up letter.
8. Make a follow-up phone call.
9. Evaluate a job offer.
10. Compare job opportunities.

CIVIL/MAP DRAFTING

UNIT I: Orientation

Competencies:
1. Describe civil/map drafting.
2. Identify terms and definitions.
3. Identify symbols.
4. Identify types of lettering.
5. Describe methods of dimensioning.
6. Describe types of lines.
7. Describe field notes.
8. Use planimeter.
9. Use map scales.
10. Use line tape.
11. Use plan and profile media.
12. Use roadway curves.
13. Use map measures.
14. Use beam compass.
15. Use stereoscope.

UNIT II: Types of Drawings

Competencies:
1. Describe and draw topographic maps.
2. Describe and draw survey plats.
3. Describe and draw subdivision plats.
4. Describe and draw geological maps.
5. Describe and draw plans and profiles.
6. Describe and draw permit drawings.
7. Describe and draw drainage maps.
8. Describe and draw oil and gas exploration maps.
9. Describe and draw hydrological maps.
10. Describe and draw steel structures.
11. Describe and draw concrete structures.
12. Describe and draw wood structures.
13. Interpret photogrammetic surveys.
14. Describe state plane coordinate system.

UNIT III: Surveying

Competencies:
1. Identify terms and definitions.
2. Identify types of surveying equipment.
3. Set up surveying equipment.
4. Run a traverse.
5. Determine elevations.
6. Record field notes.
7. Determine contours from field notes.

UNIT IV: Legal Land Descriptions

Competencies:
1. Identify terms and definitions.
2. Describe methods of legal land descriptions.
3. Describe U.S. public land survey system.
4. Describe subdivisions of a section.
5. Explain lot and block descriptions.
6. Explain metes and bounds descriptions.
7. Identify components used to develop a plat.
8. Write descriptions for the subdivision of a section.
9. Write a lot and block description.

UNIT V: Job Seeking Skills

Competencies:
1. Select means of locating job openings.
2. Prepare a resume'.
3. Prepare a personal portfolio.
4. Write a letter of application.
5. Complete an employment application.
6. Participate in a mock interview.
7. Write a follow-up letter.
8. Make a follow-up phone call.
9. Evaluate a job offer.
10. Compare job opportunities.

ARCHITECTURAL DRAFTING

UNIT I: Introduction

Competencies:
1. Identify terms and definitions.
2. Describe fundamental structural systems.
3. Identify architectural styles.
4. Identify reference materials.
5. List office phases.
6. List job titles and qualifications.
7. Use reference materials.

UNIT II: Lettering and Tools

Competencies:
1. Identify lettering styles.
2. Describe importance of good lettering.
3. Explain use of lettering heights.
4. Identify types of lettering guides.
5. Identify lettering instruments.
6. Identify tools and materials.
7. Sharpen lead correctly.
8. Letter using the Condensed style.
9. Letter using the Extended styles.

10. Letter using the Variation style.
11. Letter using the Kabel Modern style.
12. Letter using the Chisel style.
13. Letter using the Triangle style.
14. Letter using the Shadow style.

UNIT III: Site Conditions

Competencies:
1. Identify terms and definitions.
2. Describe site conditions.
3. Interpret building codes.
4. Identify types of zoning regulations.
5. Explain residential protective convenant.
6. Identify components and symbols of a plot plan.
7. Describe procedure for drawing a plot plan.
8. Describe grade marks.
9. Compile a list of site considerations.
10. Calculate altitude angle and azimuth using interpolation.
11. Calculate altitude angle and azimuth using a sun angle calculator.
12. Determine the cast of a shadow using altitude azimuth.
13. Revise plans to correct prevailing wind and orientation problems.
14. Draw a site plan.
15. Draw a plot plan.
16. Determine cut and fill needed on a given lot.
17. Set up a leveling instrument.
18. Shoot grades.

UNIT IV: Residential Design

Competencies:
1. Identify steps in planning a residence.
2. Identify characteristics which affect building design.
3. Identify rooms in basic areas of a house.
4. Describe characteristics of rooms.
5. Describe traffic flow.
6. Describe storage facilities.
7. Identify steps for making a preliminary residential sketch.
8. Determine client needs.
9. Plan a kitchen.
10. Plan a sleeping area.
11. Plan a bathroom.
12. Plan traffic patterns.
13. Plan storage facilities.
14. Develop a preliminary residential sketch.

UNIT V: Structural Systems and Building Materials

Competencies:
1. Identify terms and definitions.
2. Describe types of framing systems.
3. Describe types of wood floor sill construction.
4. Describe types of wood floor joist framing.
5. Explain purpose of bridging.
6. Identify wall framing members.
7. Describe methods of frame bracing.
8. Identify types of sheathing.
9. Identify types of roofs.
10. Identify roof framing members.
11. Describe types of cornices.

12. Describe types of post and beam framing.
13. Identify building materials.
14. Identify material symbols.
15. Describe materials in concrete mix.
16. Identify masonry construction products.
17. Identify glass products.
18. Explain uses of plastics.
19. Identify types of insulation products.
20. Identify and explain uses of metal products.
21. Identify roofing materials.
22. Identify wood products.
23. Identify abbreviations.
24. Determine sizes of wood floor joists and roof rafters.
25. Determine sizes of wood girders.
26. Determine sizes of steel beams.
27. Determine sizes of exterior or interior wall headers.

UNIT VI: Introduction to Working Drawings

Competencies:

1. Identify terms and definitions.
2. Describe title blocks.
3. Identify scales used on working drawings.
4. Identify order of set of residential working drawings.
5. Describe sheet composition.
6. Identify abbreviations.
7. Identify plan symbols.
8. Explain factors to consider when drawing elevations.
9. Describe steps in projecting elevations.
10. Describe types of schedules.
11. Sketch a floor plan of your house.
12. Draw a floor plan from a preliminary sketch.
13. Sketch different roofs on an elevation.
14. Resketch an elevation to eliminate the inconsistent use of materials.
15. Sketch two different elevations of the same floor plan.
16. Draw a front and side elevation.
17. Draw a front elevation on an uneven terrain.
18. Use local material suppliers' catalogs.
19. Complete a door and window schedule.

UNIT VII: Dimensioning

Competencies:

1. Identify terms and definitions.
2. Describe line technique at corners.
3. Explain uses of dimensions.
4. Describe drawing of wall thicknesses.
5. Explain general dimensioning rules.
6. Describe site and plot plan dimensioning.
7. Describe elevation dimensioning.
8. Describe detail and wall section dimensioning.
9. Describe heating, ventilation and air conditioning (HVAC) plan dimensioning.
10. Describe plumbing plan dimensioning.
11. Explain advantages of modular system.
12. Describe modular dimensioning.
13. Describe metric dimensioning.
14. Identify dimensioning abbreviations.
15. Identify dimensioning errors.
16. Dimension a floor plan.

17. Dimension an elevation.
18. Prepare and dimension a floor plan according to a modular system.
19. Dimension a detail using metric system (optional).

UNIT VIII: Foundations

Competencies:

1. Identify terms and definitions.
2. Identify abbreviations and symbols.
3. Identify types of floor systems.
4. Describe wood foundations.
5. Describe types of footing systems.
6. Describe footing detail drawings.
7. Describe methods of waterproofing.
8. Describe methods of termite protection.
9. Describe methods of preventing foundation breakage.
10. Explain footing design and construction.
11. Explain piling and grade beam design.
12. Explain slab foundation design.
13. Describe live and dead load.
14. Explain steps in drawing a foundation plan.
15. Calculate the footing requirements for a typical one-story frame house.
16. Calculate pier or column footing requirements.
17. Draw a foundation plan.
18. Detail a foundation section.

UNIT IX: Details

Competencies:

1. Identify terms and definitions.
2. Describe features and types of stairways.
3. Use stairway formulas.
4. Calculate stair slope.
5. Identify fireplace components.
6. Identify types of fireplaces.
7. Identify parts of windows and window section drawings.
8. Identify parts of a door section drawing.
9. Describe steps for drawing a wall section detail.
10. Construct a stairway layout.
11. Draw fireplace construction details.
12. Draw typical cabinet details.
13. Draw door and window section details.
14. Draw a wall section detail.

UNIT X: Plumbing

Competencies:

1. Identify terms and definitions.
2. Describe types of heating used in plumbing systems.
3. Describe parts of a plumbing system.
4. Describe parts and materials of a waste disposal system.
5. Explain classification of vents.
6. Describe parts of water systems.
7. Identify piping symbols and abbreviations.
8. Identify types of drawings.
9. Calculate the size of a building sewer line.
10. Construct plumbing drawings of a building drain system.
11. Construct plumbing drawings for a residential building.
12. Draw a septic system.

UNIT XI: Heating, Ventilation and Air Conditioning Systems (HVAC)

Competencies:
1. Identify terms and definitions.
2. Describe types of HVAC systems.
3. Describe types of supply duct systems.
4. Describe climatic zones.
5. Identify locations of registers and grilles.
6. Identify symbols.
7. Explain rules for drawing HVAC plans.
8. Calculate size of pipe and ducts.
9. Identify types of return air systems.
10. Describe procedure for calculating heat loss and heat gain.
11. Describe procedure for drawing an HVAC plan.
12. Calculate heat loss for a small residence.
13. Calculate shaded and unshaded glass areas for use in heat gain calculations.
14. Calculate heat gain for a small residence.
15. Evaluate the addition of insulation in relation to heat loss and heat gain.
16. Calculate heat loss and heat gain for your design project.
17. Draw an HVAC plan for your design project.
18. Prepare equipment schedules.

UNIT XII: Electrical

Competencies:
1. Identify terms and definitions.
2. Identify types of lighting dispersement.
3. Describe electrical service entrance.
4. Describe types of residential branch circuits.
5. Identify wiring devices.
6. Identify types of cables.
7. Describe conductor letter designations.
8. Describe procedure for designing an electrical system.
9. Identify floor plan electrical symbols.
10. Identify circuit safety devices.
11. Answer questions related to residential wiring practices using the NEC.
12. Interpret conduit fill tables using the NEC.
13. Locate allowable ampacities for various conductors using the NEC.
14. Calculate service size and minimum number of circuits.
15. Locate receptacle, switch, and lighting outlets.

UNIT XIII: Specifications

Competencies:
1. Identify terms and definitions.
2. Explain purpose of specifications.
3. Describe information included in specifications.
4. Describe characteristics of specifications.
5. Identify errors to be aware of in specifications.
6. Describe divisions 0-16 in the Construction Specification Institute (CSI) format.
7. Answer questions related to materials used in residential construction using *Sweet's Catalog File*.
8. Fill in an FHA "Description of Materials" form.

UNIT XIV: Presentation Drawings

Competencies:
1. Identify terms and definitions.
2. Describe types of perspectives and perspective views.
3. Describe characteristics of perspectives and presentation drawings.

4. Describe methods for drawing perspectives.
5. Explain characteristics of shade, shadow, and texture.
6. Describe rendering techniques.
7. Locate vanishing points.
8. Draw a one-point perspective.
9. Draw two-point perspectives.
10. Shade and shadow various objectives.
11. Render an elevation.
12. Render perspectives.

UNIT XV: Light Commercial Drafting

Competencies:

1. Match terms related to light commercial drafting with the correct definitions.
2. Distinguish between residential and light commercial design.
3. Match the drawings in a set of working drawings with the correct contents.
4. Match construction terms with the correct definitions.
5. Distinguish between correct and incorrect placement of reinforcing steel in light commercial construction.
6. List common types of columns.
7. List common types of wall systems.
8. Match common shapes of steel with the correct applications in construction.
9. Match typical precast concrete members with the correct applications.
10. Identify parts of a built-up roof system.
11. Distinguish between parts of specifications.
12. Identify types of architectural models.
13. Describe methods of vertical movement.
14. Identify materials used in model making.
15. Describe use of ANSI standards for handicapped persons.
16. Construct a rough scale floor plan drawing.
17. Construct a site plan drawing.
18. Construct a floor plan drawing.
19. Construct interior elevations and details.
20. Construct building elevations.
21. Construct wall sections.
22. Construct door and window details and schedules.
23. Construct a foundation plan and details.
24. Select steel pipe column size.
25. Select bar joist sizes.
26. Construct plumbing plans.

UNIT XVI: Job Seeking Skills

Competencies:

1. Select means of locating job openings.
2. Prepare a resume'.
3. Prepare a personal portfolio.
4. Write a letter of application.
5. Complete an employment application.
6. Participate in a mock interview.
7. Write a follow-up letter.
8. Make a follow-up phone call.
9. Evaluate a job offer.
10. Compare job opportunities.

STRUCTURAL DRAFTING

UNIT I: Introduction

Competencies:
1. Define structural drafting.
2. Define duties and responsibilities of structural drafters.
3. Describe the organization of a structural drafting department.
4. Discuss the drawing, checking, correcting, and revising of structural drawings.

UNIT II: Types of Structural Drawings

Competencies:
1. Describe design drawings for steel, concrete, and wood.
2. Describe detail drawings for steel, concrete, and wood.
3. Describe erection drawings for steel, concrete, and wood.

UNIT III: Structural Materials, Specifications, and Codes

Competencies:
1. Identify structural steel shapes.
2. Identify steel references and codes.
3. Identify steel specifications.
4. Describe steel materials.
5. Describe dimensional tolerances for structural steel.
6. Describe structural concrete materials.
7. Identify concrete codes.
8. Describe precast concrete.
9. Describe cast-in-place concrete.
10. Describe structural wood materials.
11. Identify structural wood codes.
12. Identify sizes and grades of wood.
13. Describe aluminum structural materials.
14. Describe composite structural materials.
15. Describe stainless steel structural materials.
16. Describe fiberglass reinforced plastic (FRP) materials.

UNIT IV: Steel Structures

Competencies:
1. Identify terms and definitions.
2. Identify symbols.
3. Describe fabrication processes.
4. Explain erection procedures.
5. Use American Institute of Steel Construction (AISC) manual.
6. Use other manuals and detailing aids.
7. Prepare design drawings from engineers' sketches.
8. Draw column details.
9. Draw beam details.
10. Draw girder details.
11. Draw truss details.
12. Draw brace and base plate details.
13. Prepare bill of materials.
14. Draw bolted connection details.
15. Draw welded connection details.
16. Prepare erection drawings and apply marking system.

UNIT V: Concrete Structures

Competencies:
1. Identify terms and definitions.
2. Identify symbols.
3. Describe construction processes (precast vs. cast-in-place).

4. Describe concrete reinforcement.
5. Describe erection procedures.
6. Use American Concrete Institute (ACI) manual and other detailing aids.
7. Prepare design drawings from engineers' sketches.
8. Prepare reinforcement placement drawings for columns, girders, footings, and slabs.
9. Prepare reinforcement bar bending diagrams and schedules.
10. Determine concrete quantities.

UNIT VI: Wood Structures

Competencies:
1. Identify terms and definitions.
2. Identify symbols.
3. Identify standard framing methods for floors, walls, and roofs.
4. Use American Institute of Timber Construction (AITC) manual and other reference materials.
5. Identify types of joints and fasteners.

UNIT VII: Final Project

Competencies:
1. Prepare a complete set of drawings including framing and foundation plans and details for one of the following: commercial building, industrial facility, petrochemical facility, or public facility.
2. Identify and use structural CAD systems software.
3. Identify and explain engineering terms.
4. Perform basic static calculations.

UNIT VIII: Job Seeking Skills

Competencies:
1. Select means of locating job openings.
2. Prepare a resume'.
3. Prepare a personal portfolio.
4. Write a letter of application.
5. Complete an employment application.
6. Participate in a mock interview.
7. Write a follow-up letter.
8. Make a follow-up phone call.
9. Evaluate a job offer.
10. Compare job opportunities.

ELECTRICAL SYSTEMS DRAFTING

Competencies:
1. Describe history and purpose of electrical drafting.
2. Identify terms and symbols.
3. Describe power generation.
4. Describe power transmission.
5. Describe power distribution.
6. Describe motor control.
7. Describe control instrumentation.
8. Describe control data acquisition.
9. Describe control devices.
10. Describe lighting illumination tasks.
11. Describe lighting levels.
12. Describe lighting fixture selection.

13. Describe lighting fixture installation.
14. Describe electronic supervisory control and data acquisition (SCADA).
15. Describe electronic telecommunications.
16. Describe electronic computers.
17. Describe electronic safety and security systems.
18. Describe electronic energy management.
19. Describe electronic distributed process control.
20. Describe electronic programmable logic controllers.
21. Identify the purpose and application of the following codes and standards:
    A. Electronic Industry Association (EIA)
    B. Radio Electronic and Television Manufacturers Association (RETMA)
    C. Federal Communications Commission (FCC)
    D. National Electrical Code (NEC)
    E. Institute of Electrical and Electronic Engineers (IEEE)
    F. National Electrical Manufacturers Association (NEMA)
    G. American National Standards Institute (ANSI)
    H. Underwriters Laboratory (UL)
    I. Canadian Standards Association (CSA)
    J. American Petroleum Institute (API)
    K. Instrument Society of America (ISA)
    L. Illumination Engineers Society (IES)
22. Describe one-line block diagrams.
23. Describe electrical schematics.
24. Describe equipment layout plans.
25. Describe wiring drawings.
26. Describe electrical detail drawings.
27. Draw one-line block diagrams.
28. Draw electrical schematics.
29. Draw equipment layout plans.
30. Prepare wiring drawings.
31. Prepare electrical detail drawings.
32. Select means of locating job openings.
33. Prepare a resume'.
34. Prepare a personal portfolio.
35. Write a letter of application.
36. Complete an employment application.
37. Participate in a mock interview.
38. Write a follow-up letter.
39. Make a follow-up phone call.
40. Evaluate a job offer.
41. Compare job opportunities.

PIPING DRAFTING

UNIT I: Pipe, Fittings, and Symbols

Competencies:
1. Identify terms, definitions and abbreviations.
2. Identify pipe sizes.
3. Use pipe wall thickness schedules.
4. Identify pipe materials.
5. Identify types of pipes.
6. Identify types of pipe fittings.
7. Identify pipe fitting ratings.
8. Identify pipe materials.
9. Identify single-line, double-line, and schematic piping symbols.
10. Identify flanges and gaskets.
11. Describe methods of dimensioning pipe.

12. Look up fittings from written descriptions and draw symbols.
13. Construct single-line drawings of screwed and socket weld pipe fittings.
14. Construct single-line drawings of welded pipe fittings.
15. Construct double-line drawings of welded pipe fittings.
16. Fill in dimensions for single-line drawings of fittings.
17. Dimension and draw single-line pipe assembly.

UNIT II: Methods of Connecting Pipe

Competencies:

1. Identify terms and definitions.
2. Describe screwed connections.
3. Describe flanged connections.
4. Describe buttweld connections.
5. Describe socketweld connections.
6. Describe other type connections.

UNIT III: Introduction to Piping Specifications

Competencies:

1. Identify terms and definitions.
2. Describe purpose of specifications.
3. Describe piping specifications.
4. Describe equipment specifications.
5. Describe design specifications.
6. Describe safety specifications.
7. Describe instrument specifications.

UNIT IV: Introduction to Piping Systems

Competencies:

1. Identify terms and definitions.
2. Describe major process piping systems.
3. Describe minor process piping systems.
4. Describe utility piping systems.

UNIT V: Valves and Valve Functions

Competencies:

1. Identify terms, definitions and abbreviations.
2. Identify types of valves.
3. Identify valve symbols.
4. Identify valve functions.
5. Identify parts of a valve.
6. Identify types of valve control.
7. Determine dimensions for valves using reference materials.
8. Draw orthographic views of valves.

UNIT VI: Flow Diagrams

Competencies:

1. Identify terms, definitions, and abbreviations.
2. Identify types of flow diagrams.
3. Identify purpose of flow diagrams.
4. Identify symbols used on flow diagrams.
5. Describe control systems.
6. Describe standards used for flow diagrams.
7. Describe how to lay out and draw flow diagrams.
8. Identify parts of line numbers.
9. Draw piping symbols.
10. Draw instrumentation and electrical symbols.
11. Draw mechanical flow diagram equipment symbols.

12. Draw an instrument hook-up.
13. Read a process flow diagram.
14. Draw a mechanical flow diagram from a sketch.
15. Draw a utility flow diagram from a sketch.

UNIT VII: Instrumentation

Competencies:
1. Identify terms and definitions.
2. Describe function of instrumentation.
3. Describe instrumentation drawings.
4. Identify instrumentation symbols.

UNIT VIII: Dimensioning

Competencies:
1. Identify terms, definitions, and abbreviations.
2. Describe methods of dimensioning piping plans.
3. Describe methods of dimension sections and elevations.
4. Describe plant coordinate dimensioning systems.
5. Describe isometric dimensions.

UNIT IX: Basic Piping Calculations

Competencies:
1. Calculate piping offsets.
2. Calculate pipe bends.
3. Perform conversion calculations.

UNIT X: Plot Plans

Competencies:
1. Identify terms and definitions.
2. Describe purpose of plot plan.
3. Identify types of plot plans.
4. Describe a contour drawing.
5. Describe an area key index plan.
6. Draw a plot plan.
7. Draw an area key index plan.

UNIT XI: Vessel and Equipment Sketches

Competencies:
1. Make sketches of pressure vessels.
2. Make sketches of tanks.
3. Make sketches of exchangers.
4. Make sketches of skids.

UNIT XII: Piping Isometrics

Competencies:
1. Identify terms and definitions.
2. Identify isometric symbols.
3. Describe erection isometrics.
4. Describe fabrication isometrics.
5. Describe spool isometrics.
6. Describe vessel trim drawings.
7. Describe procedures for drawing isometrics.
8. Describe information on drawing side of isometrics.
9. Describe information in bill of materials.
10. Letter correctly in various planes.
11. Draw and correctly place a north arrow using the preferred method.
12. Draw and letter an instrumentation balloon.

13. Calculate simple rolled offsets.
14. Draw erection isometrics.
15. Draw fabrication isometrics.
16. Draw spool isometrics.
17. Draw a vessel trim drawing.
18. Revise an isometric drawing.

UNIT XIII: Arrangement Drawings

Competencies:
1. Identify terms and definitions.
2. Describe single-line and double-line arrangement plans.
3. Describe single-line and double-line arrangement sections.
4. Describe single-line and double-line arrangement details.

UNIT XIV: Equipment

Competencies:
1. Identify terms and definitions.
2. Identify equipment codes.
3. Describe pressure vessels.
4. Describe atmospheric vessels.
5. Describe mechanical equipment.
6. Describe manifolds.
7. Describe skids.
8. Describe on-site equipment.
9. Describe off-site equipment.
10. Describe system restraint.
11. Interpret information on manufacturer's drawings.
12. Interpret schedule of openings.
13. Relay information from flow diagram to manufacturer's drawings.
14. Locate correct nozzle mark numbers on mechanical flow diagram.
15. Calculate nozzle elevation dimensions on manufacturer's drawings from given mark numbers.
16. Calculate nozzle orientation in degrees on manufacturer's drawing from given mark numbers.
17. Calculate centerline to face dimensions on manufacturer's drawing from given mark numbers.
18. Locate information on manufacturer's drawing.
19. Fill out schedule of openings chart using mechanical flow diagram.
20. Find correct nozzle sizes on mechanical flow diagram.
21. Calculate base to nozzle and to face of flange dimensions on an exchanger.
22. Draw an orientation view from flow diagram and pipe designer's single-line sketch.
23. Make pressure vessel drawings.
24. Make atmospheric vessel drawings.
25. Make mechanical equipment drawings.
26. Make manifold drawings.
27. Make skid drawings.

UNIT XV: Structural Basics

Competencies:
1. Identify terms and definitions.
2. Identify types of steel support structures.
3. Identify types of concrete support structures.
4. Prepare a piping background drawing.
5. Prepare a platform and ladder drawing.

UNIT XVI: Piping Design Fundamentals

Competencies:
1. Identify terms and definitions.
2. Describe control station components.

3. Describe arrangement of fittings.
4. Describe exchanger or reboiler piping.
5. Describe fired heater piping.
6. Describe compressor piping.
7. Describe turbine inlet and exhaust piping.
8. Describe column, vessel and storage tank piping.
9. Describe piping flexibility.
10. Identify types of pumps.
11. Identify types of ladders and platforms.
12. Construct ladder and circular platform outline drawings.
13. Lay out and pipe up a fractionation tower and pumps.
14. Perform fundamental stress analysis.
15. Identify types of pipe supports.
16. Identify pipe fabrication processes.
17. Identify types of pipe bends and loops.
18. Describe trimmed elbow and mitered fits.
19. Draw a base ell support.
20. Draw a trimmed elbow.
21. Draw a base ell spring support.
22. Draw an anchor.
23. Determine bend distances.

UNIT XVII: Working Drawings for a Unit

Competencies:

1. Draw flow diagrams.
2. Draw equipment drawings.
3. Draw plans sections and details.
4. Draw isometrics.
5. Draw spools.

UNIT XVIII: Job Seeking Skills

Competencies:

1. Select means of locating job openings.
2. Prepare a resume'.
3. Prepare a personal portfolio.
4. Write a letter of application.
5. Complete an employment application.
6. Participate in a mock interview.
7. Write a follow-up letter.
8. Make a follow-up phone call.
9. Evaluate a job offer.
10. Compare job opportunities.

MARINE DRAFTING

Competencies:

1. Describe vessel nomenclature.
2. Identify regulatory body requirements.
3. Identify shapes of hulls and explain reasons for shapes.
4. Identify structural detail practices.
5. Identify manufacturing shop practices.
6. Identify trades and crafts of the marine industry.
7. Prepare a material takeoff.
8. Interpret specifications.
9. Identify dimension references.

10. Identify types of materials.
11. Define engineering terms.
12. Calculate center of areas.
13. Draw contour lines.
14. Draw outboard profiles.
15. Prepare general arrangement drawings.
16. Draw inboard profile and scantlings.
17. Draw typical frame and bulkhead sections.
18. Prepare drawings for decks, tank tops, and flats.
19. Draw transverse sections.
20. Draw longitudinal sections.
21. Draw a shell plate expansion.
22. Prepare drawings for super structure and deck houses.
23. Prepare a propulsion arrangement drawing.
24. Prepare engine foundation detail drawings.
25. Prepare hull outfitting drawings.
26. Prepare machinery arrangement drawings.
27. Prepare schematic, double-line, and isometric piping system drawings for: bilge, ballast and fire systems; fuel oil system; potable and sanitary water systems; cooling and salt water service systems; sewer and drain systems; and air system.
28. Prepare machinery drawings for: propeller shaft, stern tube, bearing housings, steering arrangement and rudders, and deck machinery and auxiliaries.
29. Identify and define terms associated with heating, ventilating and air conditioning (H.V.A.C.) systems.
30. Draw a one-line electrical schematic.
31. Draw an electrical power plan.
32. Draw an electrical lighting plan.
33. Select means of locating job openings.
34. Prepare a resume'
35. Prepare a personal portfolio.
36. Write a letter of application.
37. Complete an employment application.
38. Participate in a mock interview.
39. Write a follow-up letter.
40. Make a follow-up phone call.
41. Evaluate a job offer.
42. Compare job opportunities.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Engineering **Course Title:** Electromechanical Technology

CIP Code: 15.0403 **Course Length** 2475 Clock Hours - 22 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical shop experience to prepare students for employment in a variety of jobs in the field of Electromechanical Technology or to provide supplemental training for persons previously or currently employed in related electromechanical occupations.

The course generally prepares individuals to assist mechanical and electrical engineers and other managers in the design, development, and testing of electromechanical devices and systems such as plant automation, automated control systems, servomechanisms, vending machines, elevator controls, missile controls, tape-control machines, and auxiliary computer equipment. Includes instruction in assisting with feasibility testing of engineering concepts; systems analysis (including design, selection, testing, and application of engineering data); and the preparation of written reports and test results.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The content is organized into competency-based units of instruction which specify occupational competencies which the student must successfully complete.

Units of Instruction:

FIRST YEAR

I. Fundamentals of Electricity Electronics
II. Mathematics
III. Physics
IV. Fundamentals of Semiconductors
V. Basic Electronic Circuits
VI. Digital Electronics
VII. Basic Microprocessors
VIII. Computer Literacy

SECOND YEAR

IX. Introduction to Electromechanical Technology
X. National Electrical Code (NEC)
XI. Mechanical Drive Systems
XII. Transformers
XIII. Generators and Motors
XIV. Programmable Controllers
XV. Control Systems and Devices
XVI. Introduction to Instrumentation
XVII. Pneumatics
XVIII. Hydraulics
XIX. Pumps, Blowers, and Compressors
XX. Human Relations
XXI. Business Practices
XXII. Job Seeking Skills

Curriculum Competency Outline

FIRST YEAR

UNIT I: Fundamentals of Electricity/Electronics

Competencies:

1. Demonstrate a knowledge of occupational job requirements, working conditions, safety hazards, pay scales, and career opportunities.
2. Identify safety hazards.
3. Demonstrate a knowledge of common safety rules and regulations.
4. Identify hand tools.
5. Demonstrate proper techniques and use of hand tools.
6. Apply correct soldering techniques.
7. Identify electrical/electronic test instruments.
8. Perform measurements using electrical/electronic test instruments.
9. Identify terms associated with electricity/electronics.
10. Identify electrical/electronic symbols.
11. Identify electrical/electronic formulas.
12. Identify electrical/electronic components.
13. Display a knowledge of atomic theory.
14. Demonstrate a knowledge of theory of ac and dc current flow.
15. Solve problems using the basic laws governing electron flow.
16. Connect electrical/electronic components in specified circuit configuration.
17. Apply safety practices.

UNIT II: Mathematics

Competencies:

1. Solve problems dealing with fractions, percentages, ratio and proportion, and powers of ten.
2. Solve problems of plane and solid geometry.
3. Solve problems using algebraic formulas.
4. Solve problems using logarithms.
5. Apply the principles in trigonometry in solving problems.
6. Solve problems using a scientific electronic calculator.

UNIT III: Physics

Competencies:

1. State the properties of matter.
2. Demonstrate the applications and effects of force, work, rate, momentum, resistance, power, potential and kinetic energy, force transformers, energy converters, transducers, vibration and waves, time constants, and radiation using mechanical energy systems.
3. Demonstrate the applications and effects of force, work, rate, momentum, resistance, power, potential and kinetic energy, force transformers, energy converters, transducers, vibration and waves, time constants, and radiation using fluidal energy systems.
4. Demonstrate the applications and effects of force, rate, resistance, power, potential and kinetic energy, force transformers, energy converters, transducers, vibration and waves, time constants, and radiation using electrical energy systems.
5. Demonstrate the applications and effects of force, work, rate, resistance, power, potential and kinetic energy, energy converters, transducers, time constants, and radiation using thermal energy systems.

UNIT IV: Fundamentals of Semiconductors

Competencies:
1. Identify terms associated with semiconductors.
2. Identify semiconductor symbols.
3. Identify semiconductor components.
4. Describe the characteristics of semiconductors.
5. Test various semiconductor devices.
6. Interpret semiconductor specification sheets.
7. Demonstrate the procedures for testing and servicing semiconductors.
8. Identify safety hazards associated with semiconductor devices.
9. Apply safety practices.

UNIT V: Basic Electronic Circuits

Competencies:
1. Identify terms associated with power supplies, amplifiers, and oscillators.
2. Identify schematic representations of power supplies, amplifiers, and oscillator circuits.
3. State the theory of operation of power supply circuits, amplifier circuits and oscillator circuits.
4. Construct and analyze various power supply circuits, amplifier circuits, and oscillator circuits.
5. Identify safety practices associated with basic electronic circuits.
6. Apply safety practices.

UNIT VI: Digital Electronics

Competencies:
1. Identify logic gate configuration.
2. Describe the truth tables associated with various logic circuits.
3. Simplify logic circuits using specified techniques.
4. Interpret integrated circuit specification sheets.
5. Identify registers, counters, multivibrators (bistable, monostable, etc.) and display devices.
6. Describe digital-to-analog and analog-to-digital techniques.
7. Analyze digital arithmetic circuits.
8. Identify safety hazards associated with digital circuits.
9. Apply safety practices.

UNIT VII: Basic Microprocessors

Competencies:
1. Identify terms associated with microprocessors.
2. Describe the basic architecture of a microprocessor.
3. Describe the basic operation of a microprocessor.
4. Demonstrate a fundamental knowledge of assembly language programming.
5. Describe system interfacing circuits and techniques.

UNIT VIII: Computer Literacy

Competencies:
1. Identify terms associated with computers.
2. Identify the impact of computers on today's society.
3. Demonstrate ability to select hardware and software components.

SECOND YEAR

UNIT IX: Introduction to Electromechanical Technology

Competencies:
1. Identify terms associated with the electromechanical technology occupation.
2. Demonstrate a knowledge of job requirements.
3. Identify safety hazards associated with the electromechanical technology occupations.
4. Demonstrate a knowledge of career opportunities.
5. Demonstrate a knowledge of the working conditions of an electromechanical technician.
6. Describe the history of the electromechanical trades.
7. Demonstrate a knowledge of the various trade publications available to the technician.
8. Demonstrate a knowledge of the various trade/professional organizations available to the technician.
9. Demonstrate a knowledge of the various code/licensing requirements in the electrical industry.

UNIT X: National Electrical Code (NEC)

Competencies:
1. Identify terms associated with the National Electrical Code.
2. Demonstrate a knowledge of the National Electrical Code.
3. Identify National Electrical Code applications.
4. Interface National Fire Protection Association (NFPA) code requirements with National Electrical Code requirements.
5. Interface National Electrical Code, National Fire Protection Association, and local code requirements.

UNIT XI: Mechanical Drive Systems

Competencies:
1. Identify terms associated with mechanical drive systems.
2. Identify various types and applications of levers.
3. Describe the operation and function of levers.
4. Identify various types and applications of wheel and axle assemblies.
5. Describe the operation and function of wheel and axle assemblies.
6. Identify various types and applications of Geneva mechanisms.
7. Describe the operation and function of Geneva mechanisms.
8. Identify various types and applications of Scotch yokes.
9. Describe the operation and function of Scotch yokes.
10. Identify various types and applications of bearings.
11. Identify various types and applications of seals.
12. Identify various types and applications of packings.
13. Identify various types and applications of clutches and brakes.
14. Identify the various types and applications of U-joints.
15. Identify the various types and applications of chain drives.
16. Identify the various types and applications of variable speed drives and belts.
17. Identify the various types and applications of gear drives.
18. Identify the various types and applications of couplings.
19. Identify various types and applications of cams and cam drives.
20. Describe the function of bearings.
21. Describe the function of seals.
22. Describe the function of packings.
23. Describe the operation of clutches and brakes.
24. Describe the operation of U-joints.
25. Describe the operation of chain drives.
26. Describe the operation of variable speed drives.
27. Describe the operation of gear drives.

28. Describe the function and operation of couplings.
29. Describe the function and operation of cams and cam drives.
30. Identify the components of seals.
31. Identify the components of clutches and brakes.
32. Identify the components of U-joints.
33. Identify the components of chain drives.
34. Identify the components of variable speed and belt drives.
35. Identify the components of gear drives.
36. Identify the components of couplings.
37. Troubleshoot bearing problems.
38. Troubleshoot seal problems.
39. Troubleshoot packing problems.
40. Troubleshoot clutch and brake problems.
41. Troubleshoot U-joint problems.
42. Troubleshoot chain drive problems.
43. Troubleshoot variable speed and belt drive problems.
44. Troubleshoot gear drive problems.
45. Troubleshoot coupling problems.
46. Troubleshoot cams and cam drive assemblies.
47. Identify the types of equipment alignments required.
48. Disassemble, inspect, repair and reassemble bearing assemblies.
49. Disassemble, inspect, repair and reassemble seal assemblies.
50. Disassemble, inspect, repair and reassemble packing assemblies.
51. Disassemble, inspect, repair and reassemble clutch and brake assemblies.
52. Disassemble, inspect, repair and reassemble U-joint assemblies.
53. Disassemble, inspect, repair and reassemble chain drive assemblies.
54. Disassemble, inspect, repair and reassemble variable speed drive assemblies.
55. Disassemble, inspect, repair and reassemble gear drive assemblies.
56. Disassemble, inspect, repair and reassemble coupling assemblies.
57. Disassemble, inspect, repair and reassemble cam and cam drive assemblies.
58. Troubleshoot lever and linkage problems.
59. Disassemble, inspect, and repair/replace levers and linkages.
60. Troubleshoot wheel and axle assemblies.
61. Disassemble, inspect, and repair/replace wheel and axle assemblies.
62. Troubleshoot Geneva mechanism problems.
63. Disassemble, inspect, and repair/replace Geneva mechanisms.
64. Troubleshoot Scotch yoke problems.
65. Disassemble, inspect, and repair/replace Scotch yokes.
66. Perform equipment installation techniques.
67. Perform equipment alignment techniques.
68. Identify preventive maintenance requirements and procedures for equipment.
69. Identify safety hazards associated with mechanical drive systems.
70. Apply safety practices.

UNIT XII: Transformers

Competencies:

1. Identify terms associated with power transformers.
2. Demonstrate a knowledge of transformer principles.
3. Demonstrate a knowledge of transformer characteristics.
4. Demonstrate a knowledge of transformer circuit configurations.
5. Test various types of transformers.
6. Troubleshoot various types of transformers.
7. Identify safety hazards associated with transformers.
8. Apply safety practices.

UNIT XIII: Generators and Motors

Competencies:

1. Identify terms associated with motors and generators.
2. Demonstrate a knowledge of the principles of electrical generators.
3. Demonstrate a knowledge of the characteristics of various types of generators.
4. Demonstrate a knowledge of the characteristics and applications of direct current motors.
5. Demonstrate a knowledge of the characteristics and applications of various types of alternating current motors.
6. Demonstrate a knowledge of the wye and delta power connections.
7. Demonstrate a knowledge of testing motors and generators.
8. Demonstrate a knowledge of troubleshooting motors and generators.

UNIT XIV: Programmable Controllers

Competencies:

1. Identify terms associated with programmable controllers.
2. Identify symbols associated with programmable controllers.
3. Demonstrate a knowledge of the theory of operation of programmable controllers.
4. Write, edit, and implement a program for a specified task.
5. Troubleshoot programmable controllers.
6. Identify safety hazards associated with programmable controllers.
7. Apply safety practices.

UNIT XV: Control Systems and Devices

Competencies:

1. Identify terms associated with control systems and devices.
2. Identify symbols of control systems and devices.
3. Identify components of control systems and devices.
4. Demonstrate a knowledge of the characteristics of control systems and devices.
5. Install control systems and devices.
6. Test control systems and devices.
7. Troubleshoot control systems and devices.
8. Identify safety hazards associated with control systems and devices.
9. Apply safety practices.

UNIT XVI: Introduction to Instrumentation

Competencies:

1. Identify terms associated with instrumentation.
2. Demonstrate a knowledge of the functions of instrumentation.
3. Identify the various components used in instrumentation.
4. Demonstrate a knowledge of the characteristics of instrumentation and control systems.
5. Test instrumentation and control systems.
6. Troubleshoot instrumentation and control systems.
7. Identify safety hazards associated with instrumentation.
8. Apply safety practices.

UNIT XVII: Pneumatics

Competencies:

1. Identify terms associated with pneumatics.
2. Identify various types and applications of pneumatics.
3. Identify the components of a pneumatics system.
4. Identify and describe uses of pneumatics systems.
5. Describe "conditioned air" for pneumatics systems.
6. Identify air sources.
7. Identify pneumatics symbols found on prints and diagrams of the industry.
8. Sketch a pneumatics system.
9. Connect components and construct a pneumatics system.
10. Take flow and pressure measurements of a pneumatics system.

11. Calibrate, analyze, troubleshoot, and repair pneumatics systems.
12. Identify uses and applications of vacuum systems.
13. Identify safety hazards associated with pneumatics systems.
14. Apply safety practices.

UNIT XVIII: Hydraulics

Competencies:

1. Identify terms associated with hydraulics.
2. Identify the principles of hydraulics.
3. Identify the components of a hydraulics system.
4. Describe the operation and function of hydraulics system components.
5. Identify hydraulics symbols.
6. Determine hydraulics horsepower.
7. Describe various types and applications of hydraulics circuits.
8. Connect components and construct a hydraulics circuit.
9. Sketch a hydraulics circuit.
10. Take flow and pressure readings of a hydraulics circuit.
11. Calibrate, analyze, troubleshoot, and repair fluidic sequencing systems.
12. Calibrate, analyze, troubleshoot, and repair hydraulic systems.
13. Identify various types of hydraulic fluids.
14. Identify safety hazards associated with hydraulic systems.
15. Apply safety practices.

UNIT XIX: Pumps, Blowers, and Compressors

Competencies:

1. Identify terms associated with pumps, blowers, and compressors.
2. Identify various types and applications of pumps.
3. Describe the operation and function of various types of pumps.
4. Identify the components of various types of pumps.
5. Analyze, troubleshoot, repair/replace, and align pumps.
6. Identify various types and applications of blowers.
7. Describe the operation and function of various types of blowers.
8. Identify the components of various types of blowers.
9. Analyze, troubleshoot, repair/replace, and align blowers.
10. Identify various types and applications of compressors.
11. Describe the operation and function of various types of compressors.
12. Identify the components of various types of compressors.
13. Analyze, troubleshoot, repair/replace, and align compressors.
14. Identify safety hazards associated with pumps, blowers, and compressors.
15. Apply safety practices.

UNIT XX: Human Relations

Competencies:

1. Identify terms associated with human relations.
2. Demonstrate a willingness to learn.
3. Demonstrate a professional attitude.
4. Demonstrate the ability to be a good listener.
5. Demonstrate the ability to follow oral and written instructions.
6. Demonstrate the ability to communicate instructions accurately and effectively.
7. Demonstrate high reliability in the performance of duties.
8. Demonstrate problem-solving skills.
9. Demonstrate punctuality.
10. Exhibit pride and loyalty.
11. Comply with safety and health rules.
12. Demonstrate personal hygiene and cleanliness.
13. Show empathy, respect, and support for others.
14. Write legibly.

UNIT XXI: Business Practices

Competencies:

1. Identify terms associated with business practices.
2. Demonstrate a knowledge of inventory control and management.
3. Demonstrate a knowledge of the cost factors involved in doing business.
4. Demonstrate a knowledge of the effects of productivity in performing service operations.
5. Maintain tools and test equipment.
6. Demonstrate a knowledge of the codes governing electromechanical operations.
7. Demonstrate a knowledge of technician license requirements.
8. Maintain service equipment.
9. Read and interpret electrical/mechanical schematics/diagrams.
10. Read and interpret parts/service manuals.
11. Maintain parts/service manual revisions.
12. Complete job scope forms and documents.

UNIT XXII: Job Seeking Skills

Competencies:

1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.
5. Write a letter of application.
6. Complete a job application.
7. Participate in a mock interview.
8. Write a follow-up letter.
9. Conduct a job search.
10. Write a letter of resignation.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Engineering **Course Title:** Motor Vessel Engineer

CIP Code: 15.0804 **Course Length** 1350 Clock Hours - 12 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical hands-on experience to prepare students for employment in a variety of jobs in the field of motor vessel engineering.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The content is organized into competency-based units of instruction which specify occupational competencies which the student must successfully complete.

The course generally prepares individuals to support propulsion engineers, ship officers, managers of marine units and fleets, or to work as manufacturers' representatives of marine propulsion units. Includes instruction in various marine propulsion units and systems and their related controls; various fuels and fuel systems and problems and hazards involved in their use; power capacity of various units; the basic design, installation, operation, maintenance and servicing of various marine propulsion units and systems; the use and design of cooling systems; operational controls; cost efficiency of various alternative propulsion systems and maintaining operation and service logs.

This program is cooperative, meaning the trainee alternates between formal (classroom) training and on-the-job training (OJT) while employed aboard vessels, rigs, or platforms. The curriculum competency outline contained herein covers only the formal training units. The training program also includes OJT tasks contained in the appropriate OJT manuals.

The curriculum competency outline herein has obtained U.S. Coast Guard approval allowing examination for various marine licenses upon successful completion.

The Coast Guard has proposed total revision of their marine licensing regulations. When these regulations become effective, a restructuring of this curriculum may be required.

This curriculum will become effective with the revision of Part 10 of Title 46 of the Code of Federal Regulations and approval of the United States Coast Guard (USCG).

Units of Instruction:
I. Introduction to Marine Operations
II. Basic Seamanship
III. Basic Engineering
IV. Life Saving
V. First Aid
VI. Fire Fighting and Tankerman
Exit Point I: Oiler (Diesel)
VII. Engineering Auxiliary Systems
VIII. Heat Transfer
IX. Pumps and Piping
X. Basic Marine Power Plants
XI. Basic Electricity
Exit Point II: Electrician
XII. Refrigeration

XIII. Stability and Damage Control
XIV. Marine Engineering Laws and Regulations
XV. Engineering Management
XVI. Human Relations
XVII. Job Seeking Skills
Exit Point III: Designated Duty Engineer

Curriculum Competency Outline

UNIT I: Introduction to Marine Operations

Competencies:

1. Identify terms associated with marine operations.
2. Demonstrate a knowledge of job requirements.
3. Demonstrate a knowledge of the unique working conditions of marine operations personnel.
4. Demonstrate a knowledge of career opportunities.
5. Demonstrate a knowledge of dress code requirements.
6. Identify unique safety hazards associated with marine operations.
7. Demonstrate a knowledge of the salaries and benefits available to members of a marine operations crew.
8. Identify the duties of the various members of the marine operations crew.
9. Identify various types and classes of vessels used in the marine industry.
10. Describe the operational differences between the various segments of the marine industry.
11. Identify licensing/code requirements for marine operations personnel.
12. Identify agencies that regulate marine operations.
13. Demonstrate a knowledge of the history of the offshore petroleum industry.
14. Demonstrate a knowledge of the processes and procedures necessary to produce oil and gas offshore.

UNIT II: Basic Seamanship

Competencies:

1. Identify terms associated with basic seamanship.
2. Identify the various classifications of seamanship.
3. Differentiate between marlinspike, deck, and boat seamanship.
4. Demonstrate the ability to tie or make various types of knots, bends, and hitches.
5. Identify deck fittings, gear, and machinery.
6. Perform deck maintenance.
7. Perform mooring procedures.
8. Perform anchoring procedures.
9. Demonstrate the ability to make up various types of tows.
10. Identify "watch-standing" duties.
11. Perform "watch-standing" duties.
12. Demonstrate the ability to execute proper radio-telephone procedures.
13. Identify various navigational aids and applications.
14. Demonstrate the ability to utilize watch, quarter, and station bill.
15. Identify basic navigational lights, shapes, and signals.
16. Demonstrate a knowledge of pollution control factors that must be considered by a basic seaman.
17. Identify safety hazards associated with basic seamanship.
18. Apply safety practices.

UNIT III: Basic Engineering

Competencies:

1. Identify terms associated with basic engineering.
2. Demonstrate a knowledge of the measurement units used in the marine industry.
3. Demonstrate a knowledge of various types of storage batteries.
4. Identify various types of hand tools.
5. Demonstrate the proper use, safety, and care of hand tools.
6. Identify various types of portable and stationary power tools.
7. Demonstrate the proper use, safety, and care of portable and stationary power tools.
8. Identify various types of measuring devices.
9. Demonstrate the proper use, safety, and care of measuring devices.
10. Identify various types of tubes/pipes and fittings.
11. Cut and thread pipe.
12. Cut, flare, and assemble tubing and fittings.
13. Inspect and report unsafe/defective tools.
14. Identify personal safety equipment.
15. Use personal safety equipment in the performance of duties.
16. Inspect and maintain personal safety equipment.
17. Perform preventive maintenance.
18. Perform start-up and shut-down procedures.
19. Identify safety hazards associated with basic engineering.
20. Apply safety practices.

UNIT IV: Life Saving

Competencies:

1. Identify terms associated with life saving and life saving techniques.
2. Identify various types of life saving gear and equipment.
3. Demonstrate the ability to use life saving gear and equipment.
4. Inspect life saving gear and equipment.
5. Maintain lifesaving gear and equipment.
6. Demonstrate a knowledge of abandon ship and survival techniques/procedures.
7. Demonstrate a knowledge of search and rescue (SAR) operations.
8. Perform search and rescue operations.
9. Identify safety hazards associated with life saving.
10. Apply safety practices.

UNIT V: First Aid

Competencies:

1. Identify terms associated with first aid.
2. Demonstrate the ability to perform multi-media first aid.
3. Demonstrate the ability to perform cardiopulmonary resuscitation (CPR) techniques.
4. Obtain and maintain Red Cross/American Heart Association certification in multi-media/cardiopulmonary resuscitation (CPR) techniques.
5. Demonstrate a knowledge of the International Medical Code (I.M.C.) and its applications.

UNIT VI: Fire Fighting and Tankerman

Competencies:

1. Identify terms associated with fire fighting and tankerman.
2. Identify fire types and classes.
3. Identify the parts of a fire.
4. Identify various types of fire extinguishers and their applications.
5. Demonstrate the ability to prevent and extinguish fires.
6. Demonstrate the ability to safely handle combustible and inflammable cargo.
7. Identify various types of general, marine, and industrial safety equipment.

8. Demonstrate the ability to use general, marine, and industrial safety equipment.
9. Maintain general, marine, and industrial safety equipment.
10. Identify breathing apparatus equipment and component parts.
11. Demonstrate the ability to use breathing apparatus.
12. Inspect and maintain breathing apparatus.
13. Demonstrate the ability to read and interpret chemical product data sheets and apply recommended handling and storage procedures to cargo being shipped.
14. Demonstrate a knowledge of the laws and regulations governing marine safety.
15. Identify safety hazards associated with fire fighting and tankerman duties.
16. Apply safety practices.

First Exit Point: **Oiler (Diesel)**

UNIT VII: Engineering Auxiliary Systems

Competencies:

1. Identify terms associated with engineering auxiliary systems.
2. Demonstrate a knowledge of the duties and responsibilities of a vessel engineer.
3. Identify various types of engineering auxiliary systems.
4. Identify the basic components of auxiliary engineering equipment.
5. Demonstrate a knowledge of the operation and function of engineering auxiliary systems.
6. Demonstrate a knowledge of hydraulic principles.
7. Demonstrate a knowledge of pneumatic principles.
8. Demonstrate proper operational use and care of engineering auxiliary systems.
9. Identify safety hazards associated with engineering auxiliary systems.
10. Apply safety practices.

UNIT VIII: Heat Transfer

Competencies:

1. Identify terms associated with heat transfer.
2. Identify various types of heat transfer systems.
3. Demonstrate a knowledge of the principles of heat transfer.
4. Identify the various classes of heat transfer systems.
5. Describe the operation and function of various classes of heat transfer systems.
6. Identify various types of insulating materials used with heat transfer systems.
7. Identify the factors that determine water treatment requirements.
8. Identify chemicals used to treat water for heat exchanger systems.
9. Demonstrate the ability to operate and maintain heat exchanger systems.
10. Analyze heat exchanger coolant and recommend treatment.
11. Apply water treatment to meet specifications of manufacturer of heat exchanger system.
12. Identify safety hazards associated with heat transfer systems.
13. Apply safety practices.

UNIT IX: Pumps and Piping

Competencies:

1. Identify terms associated with pumps and piping.
2. Identify various types of pumps used in the marine industry.
3. Identify various types of pipes and fittings used in the marine industry.
4. Identify components of various types of pumps.
5. Demonstrate the ability to operate and maintain various types of pumps.
6. Demonstrate the ability to operate and maintain piping system components.
7. Demonstrate the ability to troubleshoot, disassemble, inspect, repair/replace components, and reassemble pumps.
8. Obtain information from data plates.
9. Read and interpret piping diagrams/schematics.
10. Identify safety hazards associated with pumps and piping.
11. Apply safety practices.

UNIT X: Basic Marine Power Plants

Competencies:

1. Identify terms associated with basic marine power plants.
2. Identify various types of marine power plant systems.
3. Identify the components of marine power plants.
4. Demonstrate a knowledge of the theory of operation of marine power plants.
5. Identify pre-start-up procedures and techniques.
6. Perform pre-start-up procedures.
7. Identify start-up and shut-down procedures and techniques.
8. Perform start-up and shut-down procedures.
9. Identify various types of alarm systems utilized with marine power plants.
10. Describe the operation and function of marine power plant alarm systems.
11. Identify various types of automatic shut-down systems utilized with marine power plants.
12. Describe the operation and function of various types of automatic shut-down systems utilized with marine power plants.
13. Identify various types of engine monitoring instruments/equipment used with basic marine power plants.
14. Perform preventive maintenance on basic marine power plants.
15. Demonstrate the ability to troubleshoot, disassemble, inspect, repair/replace, and reassemble basic marine power plants.
16. Demonstrate the ability to perform an inspection and evaluate a basic marine power plant for compliance with regulations.
17. Collect engine oil samples for analysis.
18. Identify safety hazards associated with basic marine power plants.
19. Apply safety practices.

UNIT XI: Basic Electricity

Competencies:

1. Identify terms associated with electricity/electronics.
2. Identify sources of electricity.
3. Identify types of electricity.
4. Demonstrate a knowledge of the laws governing the flow of electric current.
5. Determine voltage, voltage drops, current, resistance, and power in series, parallel, and combination circuits using Ohm's Law.
6. Demonstrate a knowledge of magnetism and electromagnetism as applied to electrical devices.
7. Demonstrate a knowledge of direct current (dc) theory.
8. Demonstrate a knowledge of alternating current (ac) theory.
9. Identify electrical symbols.
10. Identify various types of electrical/electronic devices.
11. Demonstrate the ability to reset electrical devices.
12. Identify various types of emergency power sources.
13. Identify various types of electrical motors and describe their operational characteristics.
14. Obtain information from data plates.
15. Identify terminals on electric motors.
16. Identify various types of electrical generators and their operational characteristics.
17. Identify various types of electrical/electronic test instruments.
18. Perform voltage, current, resistance, and continuity measurements using electrical/electronic test instruments.
19. Demonstrate a knowledge of the requirements and procedures for paralleling generators.
20. Identify distribution panel components.

21. Demonstrate a knowledge of the applications, function, and operation of electrical distribution panels.
22. Perform an evaluation of an electrical distribution system.
23. Troubleshoot electrical problems.
24. Inspect electrical system and evaluate for code applications.
25. Repair/replace defective electrical components.
26. Read and interpret electrical diagrams/schematics.
27. Identify automatic/remote electrical start-up systems.
28. Identify alarms and interlocks.
29. Identify the applications of alarms and interlocks in marine engineering operations.
30. Identify the requirements for permissive starts.
31. Identify safety hazards associated with electrical/electronic systems.
32. Apply safety practices.

Second Exit Point: Electrician

UNIT XII: Refrigeration

Competencies:

1. Identify terms associated with refrigeration.
2. Demonstrate a knowledge of the principles of refrigeration.
3. Identify the components of a refrigeration system.
4. Identify various types of refrigerants, lubricants, and desiccants.
5. Demonstrate a knowledge of the techniques and procedures used to evacuate, clean, purge, dehydrate, and charge a refrigeration system.
6. Demonstrate the ability to operate and maintain refrigeration equipment.
7. Troubleshoot refrigeration/air conditioning equipment.
8. Identify safety hazards associated with refrigeration equipment.
9. Apply safety practices.

UNIT XIII: Stability and Damage Control

Competencies:

1. Identify terms associated with stability and damage control.
2. Identify the factors that affect vessel stability.
3. Demonstrate a knowledge of the purpose and function of a vessel stability letter/booket.
4. Demonstrate the ability to apply information contained in a vessel stability letter/booklet.
5. Demonstrate a knowledge of the interrelationship between stability and damage control.
6. Identify various damage control techniques.
7. Demonstrate the ability to apply various damage control techniques.
8. Evaluate damage and determine appropriate damage control techniques.
9. Identify safety hazards associated with stability and damage control.
10. Apply safety practices.

UNIT XIV: Marine Engineering Laws and Regulations

Competencies:

1. Identify terms associated with marine engineering laws and regulations.
2. Identify the agencies that are involved with the creation, application, and enforcement of marine engineering laws and regulations.
3. Demonstrate a knowledge of marine engineering laws and regulations.
4. Comply with marine engineering laws and regulations.
5. Complete documents/forms and file as required by regulatory agencies.

UNIT XV: Engineering Management

Competencies:

1. Identify terms associated with engineering management.
2. Demonstrate a knowledge of company and vessel organization.
3. Demonstrate a knowledge of the importance of cost control.
4. Demonstrate effective management and leadership techniques.
5. Practice effective utilization of resources.
6. Promote good customer relations.
7. Complete required documents/forms and submit them to proper agents/agencies.
8. Maintain equipment inventory and parts control.

UNIT XVI: Human Relations

Competencies:

1. Identify terms associated with human relations.
2. Demonstrate a willingness to learn.
3. Demonstrate a professional attitude.
4. Demonstrate the ability to be a good listener.
5. Demonstrate the ability to follow oral and written instructions.
6. Demonstrate the ability to communicate instructions accurately and effectively.
7. Demonstrate high reliability in the performance of duties.
8. Demonstrate problem-solving skills.
9. Demonstrate punctuality.
10. Exhibit pride and loyalty.
11. Comply with safety and health rules.
12. Demonstrate personal hygiene and cleanliness.
13. Show empathy, respect, and support for others.
14. Write legibly.

UNIT XVII: Job Seeking Skills

Competencies:

1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.
5. Write a letter of application.
6. Complete a job application.
7. Participate in a mock interview.
8. Write a follow-up letter.
9. Conduct a job search.
10. Write a letter of resignation.

Third Exit Point: Designated Duty Engineer

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Engineering

Course Title: Nondestructive Testing

CIP Code: 15.0702

Course Length 1350 Clock Hours - 12 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical experience concerned with preparing individuals for employment as nondestructive testers. The course includes, but is not limited to, communication skills, human relations and employability skills, safe and efficient work practices, radiation safety, radiography, liquid penetrant, magnetic particle, ultrasonics and eddy current testing. Includes instruction in math, applied physics, and metallurgy as pertaining to the field of nondestructive testing. The content is organized into competency-based units of instruction which specify occupational competencies the student must successfully complete.

Units of Instruction:

I. Occupational Introduction
II. Safety
III. Human Relations
IV. Metallurgy
V. Liquid Penetrant Testing (LPT)
VI. Magnetic Particle Testing (MPT)
VII. Ultrasonic Testing (UT)
VIII. Radiographic Testing (RT)
IX. Eddy Current Testing (ECT)
X. Technical Publications and Specifications
XI. Job Seeking Skills

Curriculum Competency Outline

UNIT I: Occupational Introduction

Competencies:

1. Describe the field of nondestructive testing (NDT).
2. Identify the common areas used for testing purposes in the state of Louisiana.
3. Identify the working hours and conditions involved with the field of NDT.
4. Describe job hazards associated with nondestructive testing.
5. List salary and benefits associated with employment in NDT.
6. List job opportunities available for NDT personnel.
7. Demonstrate a knowledge of the American Society for Nondestructive Testing (ASNT).
8. Demonstrate the ability to write clear, concise communications and instructions.
9. Demonstrate a knowledge of math, physics, and metallurgy as related to the field of nondestructive testing.

UNIT II: Safety

Competencies:

1. Identify terms associated with safety.
2. Demonstrate the ability to select correct tools and equipment.
3. Utilize equipment correctly.
4. Maintain clean and orderly work area.
5. Identify and describe the function of personal safety equipment and attire.
6. Follow fire codes and regulations.
7. List possible electrical hazards associated with using NDT equipment.
8. Demonstrate proper lifting techniques.
9. Demonstrate the ability to perform cardiopulmonary resuscitation (CPR).
10. Demonstrate basic emergency first aid techniques.
11. Apply OSHA regulations.
12. Demonstrate a working knowledge of the provisions of the Louisiana Radiation Regulations and the operating procedures as applied to the field of nondestructive testing.
13. Demonstrate a knowledge of the effects of radiation on body tissue.
14. Demonstrate the ability to fill out various safety records, reports, and logs.

UNIT III: Human Relations

Competencies:

1. Demonstrate personal hygiene and cleanliness.
2. Support and promote employer's company image and purpose.
3. Show empathy, respect and support for others.
4. Follow rules and regulations.
5. Listen attentively.
6. Write legibly.
7. Locate information in order to accomplish task.
8. Follow written and oral directions.
9. Maintain appearance to comply with industry and company standards.
10. Work productively with others.
11. Complete assignments in an accurate and timely manner.
12. Exhibit pride and loyalty.
13. Read and comprehend written communications and information.
14. Demonstrate problem-solving skills.
15. Demonstrate ability to set priorities.
16. Assume responsibility for own decision and actions.
17. Demonstrate punctuality.
18. Minimize occurrence of problems.
19. Channel emotional reaction constructively.
20. Exhibit dependability.

UNIT IV: Metallurgy

Competencies:

1. Identify terms associated with the composition and characteristics of metals.
2. Determine density of metals by weight.
3. Identify metals using spark and file test.
4. Differentiate between ferrous and nonferrous type metals.
5. Demonstrate a knowledge of the effects welding has on various type metals.
6. Demonstrate a knowledge of the effects various cutting methods have on metals.
7. Demonstrate a knowledge of various welding processes common to Louisiana.
8. Identify and describe weld defects associated with different welding processes.
9. Identify terms associated with welding.
10. Demonstrate a knowledge and the ability to identify sound welds on various type metals and with various type welding processes.
11. Demonstrate a knowledge of the methods of weld joint preparation.
12. Demonstrate a knowledge and the ability to perform visual inspections of various type welds.
13. Identify and describe defects common in welds of various materials.

UNIT V: Liquid Penetrant Testing (LPT)

Competencies:

1. Demonstrate a knowledge of the purposes of liquid penetrant testing
2. Identify and describe the basic principles of LPT.
3. Identify the types of liquid penetrants commercially available.
4. Describe the advantages, disadvantages, and limitations of various methods of liquid penetrant testing.
5. Demonstrate the ability to select the best LPT method for a particular job.
6. Conduct liquid penetrant test using a nonfluorescent inspection medium.
7. Conduct liquid penetrant test using a fluorescent inspection medium.
8. Interpret final results of liquid penetrant testing.
9. Demonstrate a pre-cleaning and post-cleaning.
10. Research a specification in American Welding Society (AWS) code.
11. Evaluate discontinuities in accordance with a specification.
12. Research a specification in military standards (codes).
13. Evaluate discontinuities in accordance with military standards.
14. Research a specification in American Society of Mechanical Engineers (ASME) for discontinuities.
15. Evaluate discontinuities in accordance with specifications of ASME code.
16. Research American Petroleum Institute (API) specifications for discontinuities.
17. Evaluate discontinuities in accordance with specifications of API code.
18. Make fixed indication records of penetrant tests.
19. Demonstrate the ability to write a report on LP tests conducted using various formats.

UNIT VI: Magnetic Particle Testing (MPT)

Competencies:

1. Demonstrate a knowledge of various types of magnetic particle tests.
2. Demonstrate the ability to select the proper type of MP test for a particular job.
3. Describe the advantages and disadvantages of various methods of MPT.
4. Explain the principles and/or reasons for demagnetization.
5. Demonstrate the knowledge of test indications and the interpretation of test indications.
6. Determine a leakage field using a bar magnet.
7. Calculate flux density.
8. Determine direction of magnetic flux lines.
9. Conduct an alternating current (AC) test with a yoke using a nonfluorescent and fluorescent medium and wet and dry application methods.
10. Conduct an AC test with a prod using nonfluorescent and fluorescent medium and wet and dry application methods.
11. Conduct an AC test with a coil using a nonfluorescent and fluorescent medium and wet and dry application methods.
12. Conduct an AC test with a central conductor using a nonfluorescent and fluorescent medium and wet and dry application methods.
13. Conduct a half-wave current test with a yoke using a nonfluorescent and fluorescent medium and wet and dry application methods.
14. Conduct a half-wave current test with prods using a nonfluorescent and fluorescent medium and wet and dry application methods.
15. Conduct a half-wave current test with coils using a nonfluorescent and fluorescent medium and wet and dry application methods.
16. Conduct a half-wave current test with a central conductor using a nonfluorescent and fluorescent medium and wet and dry application methods.
17. Demagnetize a part and measure field strength.
18. Interpret and evaluate discontinuities found with magnetic particle tests in accordance with the American Society of Mechanical Engineers (ASME), American Petroleum Institute (API), and the American Welding Society (AWS) codes.

19. Detect a surface discontinuity using the residual method.
20. Evaluate a discontinuity in accordance with the American Welding Society, ASME and API codes.
21. Research specification data for magnetic particle testing of discontinuities using ASME, API, and AWS codes.
22. Conduct a magnetic particle test in accordance with aircraft specifications.
23. Interpret and evaluate discontinuities found with magnetic particle tests in accordance with aircraft specifications.
24. Demonstrate various applications of magnetic particle test of API tubulars.

UNIT VII: Ultrasonic Testing (UT)

Competencies:

1. Demonstrate a knowledge of specific testing procedures for UT.
2. Demonstrate a knowledge of the selection of test parameters.
3. Demonstrate a knowledge of test standardization.
4. Demonstrate the ability to interpret test results.
5. Demonstrate a knowledge of equipment performance variations.
6. Demonstrate a knowledge of the variables that will affect test results.
7. Differentiate between longitudinal and shear wave techniques.
8. Calculate critical angles and angles of incidence with respect to angle beam testing.
9. Plot angle beam scanning paths.
10. Calibrate test equipment in accordance with ASME, American Society for Testing and Materials (ASTM), International Institute of Welding (IIW), and AWS standards and codes.
11. Perform linearity calibrations.
12. Perform sweep range calibrations.
13. Perform distance amplitude calibration (DAC).
14. Perform an ultrasonic test using the pulse-echo contact method to determine the size and depth of a flow in a specified part in accordance with ASME, ASTM, IIW, AWS, and American Bureau of Shipping (ABS) standards and codes.
15. Perform an ultrasonic test using the pulse-echo immersion method to determine a discontinuity in a specified part in accordance with ASME, ASTM, IIW, AWS, and ABS standards and codes.
16. Perform an ultrasonic test using the through-transmission contact method to determine a near surface discontinuity in accordance with ASME, ASTM, IIW, AWS, and ABS standards and codes.
17. Perform an ultrasonic test using the through-transmission immersion method to determine a near surface discontinuity in accordance with ASME, ASTM, IIW, AWS, and ABS standards and codes.
18. Perform a UT using compression and shear waves on API tubulars.
19. Demonstrate the ability to sketch and/or draw a discontinuity as discovered in an ultrasonic test method.
20. Demonstrate the ability to write a report on ultrasonic tests using various formats of technical reports.

UNIT VIII: Radiographic Testing (RT)

Competencies:

1. Identify terms associated with radiographic testing.
2. Demonstrate a knowledge of the physical principles of radiation.
3. Demonstrate a knowledge of regulations and laws governing the use of radioactive materials.
4. Demonstrate a knowledge of the characteristics of penetrating radiation.
5. Demonstrate a knowledge of radiation's interaction with matter.
6. Demonstrate a knowledge of the principles of radiography.
7. Demonstrate a knowledge of the various classes of film used in radiography.
8. Identify and describe the functions of fluorescent materials used in radiography.

9. Demonstrate a knowledge of the operation and function of electronic devices used in radiography.
10. Demonstrate a knowledge of the basic imaging considerations for radiography.
11. Demonstrate a knowledge of the sensitivity, contrast-definition and geometry as associated with the radiographic process.
12. Demonstrate the ability to use intensifying screens for radiographic testing.
13. Demonstrate the ability to select the appropriate source for a particular job.
14. Demonstrate the ability to choose the appropriate film for a particular job.
15. Determine causes and corrections of unsatisfactory radiographs.
16. Demonstrate a knowledge of the operation and usage of radiation detection and measurement equipment.
17. Describe the principles of radiation safety as related to time, distance, and shielding.
18. Calculate radiation emission of isotopes or X-rays at a given distance.
19. Calculate radiation emission of isotopes or X-ray dose rates at different distances.
20. Calculate exposure time.
21. Develop radiographs.
22. Demonstrate a knowledge of radiograph film interpretation and evaluation techniques according to codes and standards.
23. Make a radiograph examination with X-ray as the source using the superimposed method in accordance with ASME, ASTM, ABS, AWS, and API codes and standards.
24. Make a radiograph examination with X-ray as the source using the contact method in accordance with ASME, ASTM, ABS, AWS, and API codes and standards.
25. Make a radiograph examination with X-ray as the source using the circumferential method in accordance with ASME, ASTM, ABS, AWS, and API codes and standards.
26. Make a radiograph examination with X-ray as the source using the corrosion/erosion method in accordance with ASME, ASTM, ABS, AWS, and API codes and standards.
27. Determine wall thickness on tubing with gamma readings according to API codes and standards.
28. Identify safety hazards associated with radiography.
29. Identify and describe the function of personal protective devices used while working with radioactive material.
30. Apply safety practices regarding the presence of radioactive material.

UNIT IX: Eddy Current Testing (ECT)

Competencies:

1. Demonstrate a knowledge of the basic principles of ECT.
2. Identify terms associated with ECT.
3. Explain the theory of eddy current testing.
4. Identify and describe the types of sensing elements used for eddy current testing.
5. Explain the factors that affect coil impedance.
6. Demonstrate a knowledge of signal/noise ratio as applied to eddy current testing.
7. Demonstrate a knowledge of the test frequency for ECT.
8. Identify and describe the coupling used in ECT.
9. Calibrate an eddy current testing system.
10. Interpret CRT (cathode ray tube) phase relationships of typical responses to actual defects.
11. Perform an eddy current test using surface coils in accordance with ASME, ASTM, ABS, AWS, and API codes and standards.
12. Perform an eddy current test using encircling coils in accordance with ASME, ASTM, ABS, AWS, and API codes and standards.
13. Perform an eddy current test using inside coils in accordance with ASME, ASTM, ABS, AWS, and API codes and standards.
14. Perform an eddy current test using absolute coils in accordance with ASME, ASTM, ABS, AWS, and API codes and standards.
15. Perform an eddy current test using differential coils in accordance with ASME, ASTM, ABS, AWS, and API codes and standards.

UNIT X: Technical Publications and Specifications

Competencies:
1. Research ASME Code Section V for ultrasonic procedure and specification
2. Detail a welding procedure specification.
3. Research ASME Code Section V for penetrameters in ultrasonic radiographic magnetic particle testing.
4. Identify penetrameter specifications.
5. Research API specifications for lack of fusion.
6. Research AWS D1.1 for acceptance standard of ultrasonic procedure specification.
7. Identify AWS D1.1 for penetrant testing.
8. Research ASME Code Section VIII for ultrasonic testing in service boiler casings.
9. Identify discontinuities from code specifications.
10. Detail a procedure qualification record.
11. Research unknown code for specifications.
12. Create a code specification.
13. Research a code specification to match a manufactured part.
14. Detail a specification to test a manufactured part.
15. Determine proper NDT to perform on a manufactured part.
16. Determine proper NDT to perform on American Petroleum Institute (API) tubulars.

UNIT XI: Job Seeking Skills

Competencies:
1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.
5. Complete a job application.
6. Participate in a mock interview.
7. Write a follow-up letter.
8. Conduct a job search.
9. Determine goals for professional development.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Engineering **Course Title:** Process Technician

CIP Code: 15.0699 **Course Length** 1350 Clock Hours - 12 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical shop experience to prepare students for employment in a variety of jobs in the field of Process Technician or to provide supplemental training for persons previously or currently employed in related process operations.

The course generally prepares individuals to monitor, operate, and maintain equipment used in the processing of raw materials into marketable chemical/petrochemical products. Includes instruction in materials handling, crushing, grinding and sizing, extraction, distillation, evaporation, drying, absorption, heat transfer, cracking, and reaction processes. It also includes codes and standards, chemical and fire safety, and general plant operations.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The content is organized into competency-based units of instruction which specify occupational competencies which the student must successfully complete.

Units of Instruction:

I. Introduction to the Process Technician Occupation
II. Safety
III. Human Relations
IV. Mathematics for Technicians
V. Piping and Instrument Drawings
VI. Chemistry
VII. Electricity/Electronics
VIII. Flow of Fluids
IX. Tools
X. Fire Fighting
XI. Valves
XII. Instruments
XIII. Pumps
XIV. Process Compressors
XV. Air Compressors
XVI. Furnace Operations
XVII. Steam
XVIII. Heat Exchangers
XIX. Distillation/Fractionation
XX. Emergency Relief Systems
XXI. Refrigeration
XXII. Cooling Tower Operations
XXIII. Filtration
XXIV. Fork Lift and Front Loader
XXV. Materials Handling
XXVI. General Processes
XXVII. Plant Operation
XXVIII. Job Seeking Skills

Curriculum Competency Outline

UNIT I: Introduction to the Process Technician Occupation

Competencies:

1. Identify terms associated with the process technician's occupation.
2. Demonstrate a knowledge of job requirements.
3. Demonstrate a knowledge of the working conditions of a process technician.
4. Describe the factors that determine the necessity for process technicians in plant operations.
5. Demonstrate a knowledge of career opportunities.
6. Demonstrate a knowledge of codes, standards, and regulations.
7. Identify the salaries and job benefits available to the process technician.
8. Demonstrate a knowledge of the various trade/professional publications available to the process technician.
9. Demonstrate a knowledge of the various trade/professional organizations available to the process technician.
10. Identify the safety hazards associated with the process technician's job scope.
11. Identify union/non-union factors that affect the work environment for a process technician.

UNIT II: Safety

Competencies:

1. Identify terms associated with safety.
2. Develop a good safety attitude.
3. Identify and list personal safety regulations.
4. Describe good housekeeping tactics.
5. Identify personal safety equipment.
6. Use personal safety equipment in the performance of duties.
7. Identify plant safety equipment.
8. Use plant safety equipment in the performance of duties.
9. Demonstrate proper lifting techniques.
10. State the purpose of line and vessel entry permits.
11. Describe the purpose of lockout, tag, and try guidelines.
12. Describe the legal implications of a work permit.
13. Describe the "right-to-know" law governing product identification and hazards.
14. Identify hazards associated with collecting samples.
15. Identify various types of vapor testers.
16. Use vapor testers in the performance of duties.
17. Describe the importance of the Occupational Safety and Health Administration (OSHA) regulations and the Mine Safety Act (MSA).
18. Describe the safe handling of high pressure gas cylinders.
19. Maintain personal safety equipment.
20. Identify factors that affect personal and plant emergency procedures.
21. Demonstrate the ability to perform cardiopulmonary resuscitation procedures.
22. Demonstrate the ability to perform multi-media first aid techniques.
23. Apply safety practices.

UNIT III: Human Relations

Competencies:

1. Identify terms associated with human relations.
2. Demonstrate a willingness to learn.
3. Demonstrate a professional attitude.
4. Demonstrate the ability to be a good listener.
5. Demonstrate the ability to follow oral and written instructions.

6. Demonstrate the ability to communicate instructions accurately and effectively.
7. Demonstrate high reliability in the performance of duties.
8. Demonstrate problem-solving skills.
9. Demonstrate punctuality.
10. Exhibit pride and loyalty.
11. Comply with safety and health rules.
12. Demonstrate personal hygiene and cleanliness.
13. Show empathy, respect, and support for others.
14. Write legibly.
15. Demonstrate the ability to overcome objections without offending others.

UNIT IV: Mathematics for Technicians

Competencies:

1. Identify terms associated with mathematics.
2. Perform basic mathematical computations.
3. Determine areas.
4. Determine volumes.
5. Solve problems using formulas.
6. Demonstrate a knowledge of United States Standard Units of Measurement.
7. Demonstrate a knowledge of the Metric System Units of Measurement.
8. Demonstrate the ability to perform conversions.
9. Solve problems involving pressure.
10. Read and interpret graphs.
11. Determine ratios.
12. Demonstrate the ability to use various linear measuring instruments.

UNIT V: Piping and Instrument Drawings

Competencies:

1. Identify terms associated with piping and instrument drawing.
2. Identify the various types of piping and instrument drawings.
3. Identify various types of symbols, such as American National Standards Institute (ANSI), National Electrical Code (NEC), American Petroleum Institute (API), Instrument Society of America (ISA), and piping symbols.
4. Read and interpret piping and instrument drawings.
5. Read and interpret flow diagrams.
6. Demonstrate the ability to sketch a processing unit.

UNIT VI: Chemistry

Competencies:

1. Identify terms associated with chemistry.
2. Describe the states of matter and describe the characteristics of each.
3. Differentiate between and describe the characteristics of elements, mixtures, and compounds.
4. Differentiate between and describe the characteristics of acids, minerals, bases, and salts.
5. Differentiate between and describe the characteristics of organic and inorganic material classifications.
6. Identify various chemical processes/procedures controlled/monitored by process technicians.
7. Identify the classification of elements listed on a Periodic Chart.
8. Identify hydrocarbons, paraffins, and olefins.
9. Identify safety hazards associated with chemistry and chemical processes.
10. Apply safety practices.

UNIT VII: Electricity/Electronics

Competencies:

1. Identify terms associated with electricity/electronics.
2. Identify sources of electricity.

3. Identify types of electricity.
4. Demonstrate a knowledge of the laws governing the flow of electric current.
5. Determine voltage, voltage drops, current, resistance, and power in series, parallel, and combination circuits using Ohm's Law.
6. Identify various types of electrical/electronic devices.
7. Demonstrate the ability to reset electrical devices.
8. Identify various types of emergency power sources.
9. Identify automatic/remote electrical start-up systems.
10. Identify alarms and interlocks.
11. Identify the applications of alarms and interlocks in process operations.
12. Identify the requirements for permissive starts.
13. Identify safety hazards associated with electrical/electronic systems.
14. Apply safety practices.

UNIT VIII: Flow of Fluids

Competencies:

1. Identify terms associated with fluid flow.
2. Identify the major components of a fluid system.
3. Identify flow measuring devices.
4. Identify phase change of fluids.
5. Identify the factors that affect fluid flow.
6. Solve fluid flow problems using formulas.

UNIT IX: Tools

Competencies:

1. Identify terms associated with tools.
2. Identify various types of hand tools used by process technicians.
3. Use hand tools in the performance of duties.
4. Identify various types of power tools used by process technicians.
5. Use power tools in the performance of duties.
6. Identify various types of non-sparking tools.
7. Identify various types of measuring tools used by the process technician.
8. Inspect tools for defects.
9. Report defective tools.
10. Maintain tools.
11. Identify safety hazards associated with tools.
12. Apply safety practices.

UNIT X: Fire Fighting

Competencies:

1. Identify terms associated with fire and fire fighting.
2. Identify the parts of a fire.
3. Identify fire hazards.
4. Describe different classes of fires.
5. Identify various types of fire extinguishers.
6. Demonstrate the ability to use fire extinguishers.
7. Identify other sources of fire extinguishing materials.
8. Identify personal protection equipment.
9. Inspect safety equipment.
10. Maintain safety equipment.
11. Apply "first-aid" fire fighting techniques.
12. Identify fire fighting as a team effort.

UNIT XI: Valves

Competencies:

1. Identify terms associated with valves.
2. Identify various types of valves.
3. Identify valve components.
4. Describe valve applications.
5. Describe the safety applications of valves.
6. Identify factors affecting valve opening or valve closing operations.
7. Demonstrate the ability to operate valves.
8. Demonstrate the ability to select the correct tools for operating valves.
9. Identify valve malfunctions.
10. Issue work orders for valve maintenance.
11. Demonstrate the ability to remove a valve in accordance with industry standards.
12. Demonstrate the ability to install a valve to meet industry standards.
13. Maintain and service valves.
14. Perform documentation of valve servicing.
15. Identify safety hazards associated with valves.
16. Apply safety practices.

UNIT XII: Instruments

Competencies:

1. Identify terms associated with instruments.
2. Identify various types of instruments.
3. Identify the function of various types of instruments.
4. Identify various types of computers and input/output (I/O) control devices and describe their applications and functions in the instrumentation process.
5. Read field mounted instruments.
6. Read control room instruments.
7. Identify control mode.
8. Identify alarm and shut-down points.
9. Sketch a control loop.
10. Differentiate between a float and a displacer column.
11. Check sight glass levels.
12. Identify malfunctions of instruments.
13. Issue work orders for maintenance.
14. Remove and replace field mounted instruments.
15. Adjust/calibrate instruments.
16. Perform documentation of instrument servicing.
17. Install weather protection.
18. Identify safety hazards associated with instrument maintenance and servicing.
19. Apply safety practices.

UNIT XIII: Pumps

Competencies:

1. Identify terms associated with pumps.
2. Identify various types of pumps.
3. Identify various types of pump drivers.
4. Identify the components of various types of pumps.
5. Perform pump maintenance.
6. Identify the factors/conditions for permissive starts.
7. Identify pump malfunctions.
8. Issue work orders for maintenance/repair.
9. Perform lock-out and tag operations.
10. Troubleshoot pump problems.
11. Perform start-up and shut-down procedures.
12. Identify safety hazards associated with pumps.
13. Perform documentation on pump servicing.
14. Apply safety practices.

UNIT XIV: Process Compressors

Competencies:

1. Identify terms associated with process compressors.
2. Identify various types of process compressors.
3. Identify major components of process compressors.
4. Identify various types of process compressor drives.
5. Perform routine maintenance on process compressors.
6. Identify various types of compressor drivers and describe their operation and function.
7. Identify malfunctions of process compressors.
8. Troubleshoot process compressors.
9. Issue work orders for maintenance.
10. Perform lock-out and tag operations.
11. Identify the factors/conditions for permissive starts.
12. Perform start-up and shut-down devices.
13. Identify emergency shut-down devices.
14. Activate an emergency shut-down operation.
15. Document process compressor servicing.
16. Identify safety hazards associated with process compressors.
17. Apply safety practices.

UNIT XV: Air Compressors

Competencies:

1. Identify terms associated with air compressors.
2. Identify various types of air compressors.
3. Identify the components of various types of air compressors.
4. Perform routine inspection.
5. Perform preventive maintenance.
6. Perform start-up and shut-down procedures.
7. Perform lock-out and tag operations.
8. Identify the factors/conditions for permissive starts.
9. Determine proper dryer operation.
10. Determine proper instrument air dryer operation.
11. Identify emergency shut-down devices.
12. Initiate/activate emergency shut-down operations.
13. Identify the different applications for compressed air in a process plant.
14. Identify safety hazards associated with air compressors.
15. Apply safety practices.

UNIT XVI: Furnace Operations

Competencies:

1. Identify terms associated with furnace operations.
2. Identify various types of furnaces used in process operations.
3. Identify the parts of a furnace.
4. Identify various types of safety devices used on furnaces.
5. Identify various start-up and shut-down devices.
6. Identify various types of fuel.
7. Describe proper furnace operation.
8. Interpret an analysis of flue gases.
9. Describe normal operation of a furnace.
10. Perform routine inspections.
11. Describe economizing equipment used in furnace operation.
12. Perform shut-down maintenance.
13. Operate soot blowers.
14. Identify various types of furnace draft systems.
15. Adjust registers/dampers.
16. Use personal safety equipment.

17. Maintain a pilot burner system.
18. Identify furnace operation factors that affect Environmental Protection Agency (EPA) regulations.
19. Interpret draft gauge readings.
20. Identify emergency shut-down devices.
21. Activate emergency shut-down devices.
22. Identify safety hazards associated with furnace operations.
23. Apply safety practices.

UNIT XVII: Steam

Competencies:

1. Identify terms associated with steam systems.
2. Identify the various types of equipment used to produce steam.
3. Identify the applications of steam systems in process operations.
4. Identify steam pressures normally used in process operations.
5. Identify various types of boilers.
6. Identify the components of a boiler.
7. Identify the components of steam systems.
8. Identify safety devices associated with steam systems.
9. Identify the types of fuel used for steam generation.
10. Prepare water for boiler usage.
11. Test water and water treating system.
12. Operate equipment used to condition boiler feed water.
13. Make adjustments on water treatment systems.
14. Perform start-up and shut-down procedures on boilers.
15. Identify the factors/conditions for permissive starts.
16. Perform start-up of a steam header system.
17. Identify shut-down interlocks.
18. Monitor gauges.
19. Identify steam recovery systems.
20. Perform "blow-down" operations on boilers.
21. Check let-down stations for variations in pounds-per-square-inch-gauge (PSIG) pressure indications.
22. Identify the safety hazards associated with steam generation, use, and handling.
23. Apply safety practices.

UNIT XVIII: Heat Exchangers

Competencies:

1. Identify terms associated with heat exchangers.
2. Identify various types of heat exchangers.
3. Describe the operation and function of a heat exchanger.
4. Perform routine maintenance.
5. Identify types of heat transfer.
6. Troubleshoot heat exchanger problems.
7. Issue work orders for maintenance.
8. Perform back-flush procedures.
9. Commission a heat exchanger.
10. Identify safety hazards associated with heat exchangers.
11. Apply safety practices.

UNIT XIX: Distillation/Fractionation

Competencies:

1. Identify terms associated with distillation/fractionation operations.
2. Identify the purpose of the distillation/fractionation process.
3. Identify the various types of distillation/fractionation processes.
4. Identify the internal components of distillation/fractionating equipment.
5. Identify auxiliary equipment associated with distillation/fractionating process equipment.
6. Identify control schemes/methods.
7. Identify start-up and shut-down procedures.

8. Identify basic interlocks/fail-safe devices.
9. Identify operational problems.
10. Troubleshoot distillation/fractionation equipment problems.
11. Identify safety hazards associated with distillation/fractionation operations.
12. Apply safety practices.

UNIT XX: Emergency Relief Systems

Competencies:

1. Identify terms associated with emergency relief systems.
2. Identify emergency relief system equipment.
3. Describe the purpose of emergency relief systems.
4. Identify emergency relief system factors that are affected by Environmental Protection Agency (EPA) regulations.
5. Identify the applications and describe the operation and function of flares in emergency relief systems.
6. Identify safety hazards associated with emergency relief systems.
7. Apply safety practices.

UNIT XXI: Refrigeration

Competencies:

1. Identify terms associated with refrigeration.
2. Describe the theory of refrigeration.
3. Identify the components of a refrigeration system.
4. Identify the types of refrigerants used in a refrigeration system.
5. Identify the uses/applications of refrigeration in processing operations.
6. Operate a refrigeration system.
7. Identify interlocks associated with refrigeration systems.
8. Troubleshoot refrigeration systems.
9. Identify safety hazards associated with refrigeration systems.
10. Apply safety practices.

UNIT XXII: Cooling Tower Operations

Competencies:

1. Identify terms associated with cooling towers.
2. Identify the purpose of cooling towers.
3. Identify various types of cooling towers.
4. Describe the theory of cooling tower operations.
5. Identify the components of cooling towers.
6. Identify normal/abnormal operating conditions.
7. Maintain water quality.
8. Take samples.
9. Analyze samples.
10. Make adjustments to assure water quality.
11. Perform routine maintenance.
12. Perform start-up and shut-down procedures.
13. Identify safety hazards associated with cooling towers.
14. Apply safety practices.

UNIT XXIII: Filtration

Competencies:

1. Identify terms associated with filtration.
2. Identify various types of filtration systems.
3. Identify filtration equipment.
4. Identify the purpose of filtration.
5. Describe various filtering materials.
6. Describe various cleaning materials.
7. Identify normal/abnormal operating conditions.
8. Perform routine maintenance.
9. Perform start-up and shut-down procedures.
10. Perform back-flush/cleaning operations.

UNIT XXIV: Fork Lift and Front Loader

Competencies:
1. Identify terms associated with fork lifts and front loaders.
2. Participate in Occupational Safety and Health Agency (OSHA) regulated training governing the operation of materials handling equipment.
3. Perform routine inspection of equipment.
4. Demonstrate the ability to operate fork lifts and front loaders properly.
5. Maintain operator certification.

UNIT XXV: Materials Handling

Competencies:
1. Identify terms associated with materials handling.
2. Identify local, state, and federal regulations governing materials handling.
3. Identify equipment used for handling/transferring materials.
4. Identify various types of storage vessels/containers.
5. Identify various types of hoses and couplings used in materials handling.
6. Identify methods used for solids material handling.
7. Perform gauging tasks.
8. Perform sampling techniques.
9. Perform pre/post loading inspections.
10. Identify safety hazards associated with materials handling.
11. Use chemical data sheets to identify required handling precautions.
12. Apply safety practices.

UNIT XXVI: General Processes

Competencies:
1. Identify associated general processes.
2. Identify terms associated with stripping processes.
3. Identify terms associated with absorption processes.
4. Identify terms associated with cracking processes.
5. Identify terms associated with evaporation processes.
6. Identify terms associated with reaction processes.
7. Identify safety hazards associated with stripping processes.
8. Identify safety hazards associated with absorption processes.
9. Identify safety hazards associated with cracking processes.
10. Identify safety hazards associated with evaporation processes.
11. Identify safety hazards associated with reaction processes.
12. Apply safety practices.

UNIT XXVII: Plant Operation

Competencies:
1. Identify terms associated with plant operation.
2. Demonstrate the safe, economical operation of a process plant as an "outside" process technician.
3. Demonstrate the safe, economical operation of a process plant as an "inside" process technician.

UNIT XXVIII: Job Seeking Skills

Competencies:
1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.
5. Write a letter of application.
6. Complete a job application.
7. Participate in a mock interview.
8. Write a follow-up letter.
9. Conduct a job search.
10. Write a letter of resignation.

HEALTH OCCUPATIONS

Emergency Medical Technician (EMT) - Paramedic
Medical Laboratory Technician - Certificate
Nurse Assistant
Practical Nursing
Respiratory Therapy Technician
Surgical Technology
Ward Clerk

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Health Occupations

Course Title: Emergency Medical Technician - Paramedic

CIP Code: 17.0206

Course Length 1350 Clock Hours - 12 Months

Course Description:

This course prepares students for employment in health care areas as attendants in emergency departments, ambulance services, fire departments, and mobile advanced life support units. The EMT-P provides pre-hospital emergency care to acutely ill or injured patients under control or supervision of a physician.

Classroom instruction, clinical instruction, practice instruction, and supervised field internship in an advanced life support unit that functions under a medical command authority are the four components of this course. Students are taught to work with and under the direction of physicians in providing emergency medical care in the field, at the scene, and during transit to an emergency care center. A high school diploma or equivalent is required for entry into this competency-based course.

Units of Instruction:

I. Basic
II. Intermediate
III. Paramedic
IV. Employment Preparation

Curriculum Competency Outline

UNIT I: Basic

Competencies:

1. Describe the roles and responsibilities of the EMT during each phase of an ambulance run.
2. Conduct a patient assessment for illnesses/injuries.
3. Identify any emergency medical condition.
4. Identify and describe appropriate signs and symptoms.
5. Describe the design, purpose and function of the body parts involved.
6. Indicate priority for triage purposes.
7. Provide appropriate emergency care to stabilize the patient's condition.
8. Lift and move the patient and position him appropriately depending on his condition in order to minimize discomfort and further injury.
9. Identify precautions in dealing with emergency conditions.
10. Transport patients to medical facilities.
11. Deal with patient's relatives, friends, bystanders, police and other officials at the scene.
12. Secure the safety of the emergency scene, if necessary.
13. Observe and preserve evidence at the scene as appropriate.
14. Plan and carry out procedures to care for patients in wrecked vehicles and other inaccessible locations.
15. Assist with and/or perform extrication of patients from inaccessible locations.
16. Maintain communications with dispatcher and other emergency personnel.
17. Record a variety of information.
18. Participate in disaster planning and exercises.

19. Maintain emergency vehicle in a ready state.
20. Drive emergency vehicle safely and expertly under all conditions of weather, traffic and terrain.
21. Identify any legal requirements for dealing with emergency conditions.

UNIT II: Intermediate

Competencies:

1. Recognize a medical emergency.
2. Assess the emergency situation.
3. Perform emergency care.
4. Perform extrication.
5. Coordinate efforts with other agencies.
6. Establish rapport with patient and significant others to decrease their state of crisis.
7. Assign priorities of emergency treatment.
8. Record and communicate data to the designated medical command authority.

*9. Initiate and continue appropriate invasive and noninvasive emergency therapy under medical control.

10. Exercise personal judgment in case of interruption in medical direction caused by communication failure.
11. Exercise personal judgment in cases of immediate life-threatening conditions.
12. Recognize limitations in patient care imposed by local medical authority.

*Intermediate level has limited invasive skills.

UNIT III: Paramedic

Competencies:

1. Recognize a medical emergency.
2. Assess the emergency situation.
3. Perform emergency care.
4. Perform extrication.
5. Coordinate efforts with other agencies.
6. Establish rapport with patient and significant others to decrease their state of crisis.
7. Assign priorities of emergency treatment.
8. Record and communicate data to the designated medical command authority.

*9. Initiate and continue appropriate invasive and noninvasive emergency therapy under medical control.

10. Assess the response of the patient to emergency therapy.
11. Exercise personal judgment in cases of immediate life-threatening conditions.
12. Recognize limitations in patient care imposed by local medical authority.

*Paramedic level has more comprehensive invasive skills.

UNIT IV: Employment Preparation—Paramedic

Competencies:

1. Explain procedures for obtaining and renewing certification and/or license to practice.
2. Describe role of EMT relating to Louisiana state laws.
3. Prepare personal resume'.
4. Complete a job application.
5. Describe procedure for resignation.
6. Write a letter of resignation.
7. Participate in a mock interview.
8. Promote public relations within the work place.
9. Discuss Equal Opportunity Employment provisions and Affirmative Action policies in the work place.
10. Review job opportunities available to EMTs.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Health Occupations

Course Title: Medical Laboratory Technician - Certificate

CIP Code: 17.0305

Course Length 1575 Clock Hours - 14 Months

Course Description:

Through classroom instruction and clinical experiences this course prepares individuals to perform diagnostic tests and procedures in a clinical laboratory under the supervision of medical technologists and pathologists.

Included are the areas of blood chemistry, bacteriology, cell preparation and examination, urine analysis, basic anatomy and physiology, medical terminology, and the study of parasites in a competency-based format.

A high school education or equivalent is required for admission to this course.

Units of Instruction:

I. Orientation to the Medical Laboratory
II. Basic Medical Terminology
III. Basic Anatomy and Physiology
IV. Hematology and Coagulation
V. Urinalysis and Other Body Fluids Analysis
VI. Immunology and Immunohematology
VII. Clinical Chemistry and Instrumentation
VIII. Microbiology
IX. Parasitology
X. Introduction to Histology
XI. Clinical Practicum in Hematology and Coagulation
XII. Clinical Practicum in Urinalysis and Other Body Fluids Analysis
XIII. Clinical Practicum in Immunology and Immunohematology
XIV. Clinical Practicum in Clinical Chemistry and Instrumentation
XV. Clinical Practicum in Microbiology
XVI. Clinical Practicum in Parasitology
XVII. Clinical Practicum in Histology
XVIII. Employment Preparation

Curriculum Competency Outline

UNIT I: Orientation to the Medical Laboratory

Competencies:

1. Demonstrate safety protocols.
2. Identify hospital and laboratory organization.
3. Identify registry and certification requirements.
4. Demonstrate ethical and legal responsibilities.
5. Follow rules and regulations.
6. Demonstrate communication skills.
7. Operate laboratory equipment.
8. Perform basic laboratory calculations.
9. Perform basic computer operations.

UNIT II: Basic Medical Terminology

Competencies:
1. Identify and define medical terms.
2. Use accepted medical abbreviations.

UNIT III: Basic Anatomy and Physiology

Competencies:
1. Describe body structures.
2. Describe functions of body systems.
3. Identify related diseases.

UNIT IV: Hematology and Coagulation

Competencies:
1. Identify criteria for specimen collection, handling and rejection.
2. Obtain venous and capillary blood.
3. Classify formation, function and destruction of blood cells.
4. Identify reagents and instruments.
5. Perform Complete Blood Counts (CBC).
6. Perform differentials.
7. Perform platelet counts.
8. Identify special staining procedures.
9. Perform eosinophil counts.
10. Perform sickle cell tests.
11. Perform reticulocyte counts.
12. Perform Lupus Erythematosus (L.E.) cell examination.
13. Perform erythrocyte sedimentation rates.
14. Identify bone marrow examinations.
15. Perform osmotic fragility tests.
16. Perform coagulation tests.
17. Recognize leucocyte and erythrocyte disorders.
18. Identify the coagulation mechanism and fibrinolytic system.
19. Perform Prothrombin Time (P.T.) and Partial Thromboplastin Time (PTT) tests.
20. Perform bleeding time tests.
21. Perform capillary fragility tests.
22. Identify fibrinogen levels.
23. Discuss Fibrin Degradation Products (FDP) tests.
24. Discuss clotting time tests.
25. Discuss factor assays.
26. Discuss thrombin time tests.
27. Discuss other miscellaneous coagulation tests.
28. Recognize platelet disorders and other coagulation disorders.
29. Discuss quality assurance, safety precautions and infection control.

UNIT V: Urinalysis and Other Body Fluids Analysis

Competencies:
1. Identify renal anatomy, physiology and disorders.
2. Identify criteria for specimen collection, handling, and rejection.
3. Identify reagents and instruments.
4. Perform a complete routine urinalysis.
5. Perform routine Urine Pregnancy Tests (UPT).
6. Perform chemical analysis and confirmatory tests.
7. Discuss osmolality and other concentration procedures.
8. Describe tests performed on cerebrospinal fluid.
9. Describe tests performed on synovial fluid.
10. Describe tests performed on amniotic fluid.
11. Describe tests performed on seminal fluid.

12. Describe tests performed on pleural fluid.
13. Describe tests performed on pericardial fluid.
14. Describe tests performed on peritoneal fluid.
15. Describe tests performed on gastric fluid.
16. Evaluate correlation of test results.
17. Discuss quality assurance, safety precautions and infection control.

UNIT VI: Immunology and Immunohematology

Competencies:

1. Identify criteria for specimen collection, handling and rejection.
2. Describe the immune process.
3. Define the basic theory of genetics.
4. Identify types of serological reactions.
5. Identify reagents and instruments.
6. Perform basic dilutions.
7. Perform tests for syphilis.
8. Perform febrile agglutination tests.
9. Perform serological tests for Rheumatoid Arthritis.
10. Perform antistreptolysin O titers.
11. Perform C-Reactive protein tests.
12. Perform Infectious Mononucleosis tests.
13. Describe serum pregnancy tests.
14. Discuss other miscellaneous serological tests and Acquired Immune Deficiency Syndrome (AIDS) related tests.
15. Recognize blood groups and systems.
16. Perform blood typing and grouping.
17. Perform antibody screenings and identification.
18. Perform routine compatibility tests.
19. Identify criteria for release of donor blood products.
20. Investigate transfusion-related reactions.
21. Define criteria for blood donors.
22. Identify blood collection procedures and donor care.
23. Identify techniques for donor blood processing, component preparation, labeling, and storage.
24. Solve technical laboratory problems.
25. Identify Hemalytic Disease of Newborn (HDN) and criteria for Rh immune globulin candidates.
26. Discuss quality assurance, safety precautions and infection control.

UNIT VII: Clinical Chemistry and Instrumentation

Competencies:

1. Identify criteria for specimen collection, handling and rejection.
2. Identify reagents, reactions, and instruments.
3. Describe protein studies and abnormal conditions of proteins.
4. Describe carbohydrate studies and abnormal conditions of carbohydrates.
5. Describe nonprotein nitrogen compound procedures and their abnormal conditions.
6. Describe liver function studies and their abnormal conditions.
7. Describe enzyme studies and their abnormal conditions.
8. Describe endocrine studies and their abnormal conditions.
9. Describe water, electrolytes, acid-base and oxygen studies and their abnormal conditions.
10. Describe lipid studies and their abnormal conditions.
11. Describe toxicology studies and their abnormal conditions.
12. Discuss quality assurance, safety precautions and infection control.

UNIT VIII: Microbiology

Competencies:

1. Identify criteria for specimen collection, handling and rejection.
2. Identify reagents, reactions, and instruments.
3. Identify types of microorganisms and morphological characteristics.
4. Identify types of media and storage methods.
5. Identify sterilization techniques.
6. Prepare and read a gram stain.
7. Prepare and read an acid-fast bacilli stain.
8. Identify basic culture and subculture techniques.
9. Identify biochemical tests.
10. Identify sensitivity tests and reactions.
11. Recognize growth requirements.
12. Describe rapid identification techniques.
13. Discuss quality assurance, safety precautions, and infection control.

UNIT IX: Parasitology

Competencies:

1. Identify criteria for specimen collection, handling and rejection.
2. Identify reagents, reactions, and instruments.
3. Describe normal and abnormal characteristics of fecal and nonfecal materials
4. Perform or describe fecal fat, pH, occult blood and reducing substance tests
5. Perform direct examination and concentration techniques.
6. Identify gross and microscopic human parasites.
7. Identify special stain and preservation procedures.
8. Describe preparation and examination of blood smears for malarial parasites
9. Discuss quality assurance, safety precautions and infection control

UNIT X: Introduction to Histology

Competencies:

1. Identify criteria for specimen collection, handling, and rejection.
2. Identify reagents and instruments.
3. Fix tissues.
4. Embed tissues in paraffin.
5. Cut thin sections and mount on slides.
6. Stain tissue slides.
7. Prepare frozen sections.
8. Assist pathologist in dissecting gross specimens.
9. Discuss quality assurance, safety precautions and infection control

UNIT XI: Clinical Practicum in Hematology and Coagulation

Competencies:

1. Verify requisition and prepare collection equipment.
2. Collect, label, and handle venous and capillary blood.
3. Perform a manual and an automated CBC.
4. Perform a differential.
5. Perform a platelet count.
6. Perform special staining procedures.
7. Perform eosinophil counts.
8. Perform sickle cell tests.
9. Perform reticulocyte counts.
10. Perform LE cell examinations.
11. Perform erythrocyte sedimentation rates.
12. Perform bone marrow examinations.
13. Perform osmotic fragility tests.
14. Perform coagulation tests.
15. Perform PT and PTT tests.

16. Perform bleeding time tests.
17. Perform capillary fragility tests.
18. Perform fibrinogen levels.
19. Perform FDP tests.
20. Perform clotting time tests.
21. Discuss factor assays.
22. Discuss thrombin time tests.
23. Discuss other miscellaneous coagulation tests.
24. Perform quality assurance, safety precautions, and infection control procedures.

UNIT XII: Clinical Practicum in Urinalysis and Other Body Fluids Analysis

Competencies:

1. Verify requisition, labeling, and collection.
2. Prepare specimen for examination.
3. Perform a complete routine urinalysis.
4. Perform a routine urine pregnancy test.
5. Perform other chemical analysis and confirmatory tests.
6. Discuss osmolality and other concentration procedures.
7. Process cerebrospinal fluid and perform appropriate tests as requested.
8. Process synovial fluid and perform appropriate tests as requested.
9. Process amniotic fluid and perform appropriate tests as requested.
10. Process seminal fluid and perform appropriate tests as requested.
11. Process pleural fluid and perform appropriate tests as requested.
12. Process pericardial fluid and perform appropriate tests as requested.
13. Process peritoneal fluid and perform appropriate tests as requested.
14. Process gastric fluid and perform appropriate tests as requested.
15. Perform quality assurance, safety precautions, and infection control procedures.

UNIT XIII: Clinical Practicum in Immunology and Immunohematology

Competencies:

1. Verify requisition and prepare collection equipment.
2. Collect, label and handle specimen.
3. Perform tests for syphilis.
4. Perform febrile agglutination tests.
5. Perform serological tests for Rheumatoid Arthritis.
6. Perform antistreptolysin O titers.
7. Perform C-reactive protein tests.
8. Perform Infectious Mononucleosis tests.
9. Perform serum pregnancy tests.
10. Discuss other miscellaneous serological tests and AIDS related tests.
11. Perform blood typing and grouping.
12. Perform antibody screenings and identification.
13. Perform routine compatibility tests.
14. Verify and release donor blood products.
15. Investigate transfusion-related reactions.
16. Define criteria for blood donors.
17. Perform blood collection procedures and donor care.
18. Perform techniques for donor blood processing, component preparation, labeling, and storage.
19. Solve technical laboratory problems.
20. Identify Hemalytic Disease of Newborn (HDN) and criteria for Rh immune globulin candidates.
21. Perform quality assurance, safety precautions and infection control procedures.

UNIT XIV: Clinical Practicum in Clinical Chemistry and Instrumentation

Competencies:

1. Verify requisition and prepare collection equipment.
2. Collect, label, and handle specimens.
3. Perform protein studies.
4. Perform carbohydrate studies.
5. Perform nonprotein nitrogen compound procedures.
6. Perform liver function studies.
7. Perform enzyme studies.
8. Perform endocrine studies.
9. Perform water, electrolyte, acid-base, and oxygen studies.
10. Perform lipid studies.
11. Perform toxicology studies.
12. Perform quality assurance, safety precautions, and infection control procedures.

UNIT XV: Clinical Practicum in Microbiology

Competencies:

1. Verify requisition, collection, labeling, and handling.
2. Prepare and read a gram stain.
3. Prepare and read an acid-fast bacilli stain.
4. Perform basic culture and subculture techniques.
5. Perform biochemical tests.
6. Perform sensitivity tests.
7. Recognize growth requirements.
8. Describe rapid identification techniques.
9. Perform quality assurance, safety precautions, and infection control procedures.

UNIT XVI: Clinical Practicum in Parasitology

Competencies:

1. Verify requisition, labeling, collection, and handling of specimen.
2. Perform fecal fat, pH, occult blood, and reducing substance tests.
3. Perform direct examination and concentration techniques.
4. Identify gross and microscopic human parasites.
5. Perform special stain and preservation procedures.
6. Describe preparation and examination of blood smears for malarial parasites.
7. Perform quality assurance, safety precautions, and infection control procedures.

UNIT XVII: Clinical Practicum in Histology

Competencies:

1. Verify requisition, labeling, and handling of specimen.
2. Fix tissues.
3. Embed tissues in paraffin.
4. Cut thin sections and mount on slides.
5. Stain tissue slides.
6. Prepare frozen sections.
7. Assist pathologist in dissecting gross specimens.
8. Perform quality assurance, safety precautions, and infection control procedures.

UNIT XVIII: Employment Preparation

Competencies:

1. Prepare a personal resume'.
2. Fill out a job application.
3. Prepare a letter of application.
4. Prepare a follow-up letter.
5. Participate in a mock job interview.
6. Explain procedure for obtaining and renewing certification to practice.
7. Describe procedure for resignation.
8. Write a letter of resignation.
9. Review potential job and educational opportunities.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Health Occupations **Course Title:** Nurse Assistant

CIP Code: 17.0602 **Course Length** 281 Clock Hours - 2½ Months

Course Description:

The Nurse Assistant Course prepares students for employment in hospitals, long-term care facilities, and home health agencies where primary care is needed. Classroom instruction includes basic nursing skills, basic anatomy and physiology, infection control, and employment preparation. Students also participate in clinical activities in a long-term care facility under the supervision of their instructor.

Units of Instruction:

I. Orientation
II. Body Structure and Function
III. Infection Control
IV. Basic Nursing Skills
V. Advanced Nursing Skills
VI. Skills in Special Areas
VII. Employment Preparation

Curriculum Competency Outline

UNIT I: Orientation

Competencies:

1. Identify the purpose of health care institutions.
2. Identify the organizational structure within the health care institution and the health care team.
3. Identify the roles and responsibilities of each member of the health care team.
4. Identify the duties and responsibilities of the nurse assistant.
5. Identify standards of ethical and professional behavior.
6. Exhibit good personal grooming and hygiene practices.
7. Identify and use appropriate communication and observation skills.
8. Identify potential hazards in home and health care environments and procedures.
9. Demonstrate fire safety procedures.
10. Identify and use techniques of good body mechanics.
11. Perform cardiopulmonary resuscitation (CPR).
12. Identify the major types of patients.
13. Exhibit understanding, tact, and competence when working with patients and families.
14. Explain the legal responsibilities of the nurse assistant.
15. Explain the religious practices that may be encountered.

UNIT II: Body Structure and Function

Competencies:
1. Identify terms and match them with definitions.
2. Identify body cavities and the major organs.
3. Identify structure and functions of a cell, tissues, and organs.
4. Identify locations and functions of the major body systems.

UNIT III: Infection Control

Competencies:
1. Identify terms and definitions.
2. Identify prevention, spread, and growth factors of microorganisms.
3. Perform appropriate handwashing procedures.
4. Identify and perform appropriate isolation techniques.

UNIT IV: Basic Nursing Skills

Competencies:
1. Identify and care for commonly used patient-care equipment.
2. Demonstrate techniques of taking temperature, pulse, respirations, and blood pressure.
3. Perform a.m. and p.m. care.
4. Identify and perform types of baths.
5. Identify and perform types of bed making.
6. Assist with meals.
7. Admit and discharge patients.
8. Assist with elimination needs.
9. Identify and perform types of enemas.
10. Assist with ambulation and transfer.
11. Demonstrate appropriate skin and decubitus care.
12. Care for the dying patient and his/her family.

UNIT V: Advanced Nursing Skills

Competencies:
1. Identify terms and definitions.
2. Measure and record intake and output.
3. Perform appropriate specimen collection and transfer techniques.
4. Perform prosthesis care.
5. Perform warm and cold applications.
6. Perform catheter care.
7. Provide appropriate care for patients with infusions, subclavian lines, naso-gastric tubes and urinary catheters.
8. Demonstrate application of binders, elastic stockings, bandages, and slings.
9. Perform clinitests and acetone tests.
10. Perform presurgical skin preps.
11. Perform appropriate pediatric urine collection techniques.
12. Demonstrate appropriate postpartal and nursery techniques.
13. Care for patients with seizure activity.
14. Care for patients in traction, casts, and turning frames.
15. Care for ostomy patients.

UNIT VI: Skills in Special Areas

Competencies:
1. Demonstrate appropriate use and care of telemetry equipment.
2. Discuss hazards in giving personal care to critical care patients, psychiatric patients, home health patients, and long-term care patients.
3. Discuss the importance of maintaining emotional support of patients in highly technical areas.

4. Use the ability to improvise when standard equipment is not available in home health care.
5. Discuss the importance of the patients' needs, rights, and dignity.
6. Discuss the importance of using good judgment in interacting with special needs patients.
7. Recognize and discuss the changes in each body system associated with the aging process.
8. Recognize and discuss the requirements for home-bound status in Home Health.

UNIT VII: Employment Preparation

Competencies:

1. Explain the procedure for obtaining training and appropriate certification.
2. Describe career advancement opportunities.
3. Complete a job application.
4. Describe procedure for resignation.
5. Write a letter of resignation.
6. Participate in a mock interview.
7. Discuss Equal Opportunity Employment provisions and Affirmative Action policies in the work place.
8. Promote loyalty and confidentiality within the work place.
9. Promote good public relations in the work place.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Health Occupations

Course Title: Practical Nursing

CIP Code: 17.0605

Course Length 1500-1600 Clock Hours - 14 Months

Course Description:

The Practical Nursing course includes both classroom instruction and supervised clinical activities in accredited hospitals and nursing homes. A high school education or its equivalent is required for admission. Upon graduation, the student is eligible to take the licensure examination given by the Louisiana State Board of Practical Nurse Examiners and to become a Licensed Practical Nurse (LPN).

Classroom instruction includes anatomy and physiology, basic and advanced nursing skills, pharmacology, diet therapy, maternal and child health, pediatrics, nursing care of the adult, and intravenous therapy in a competency-based course. This course is approved by the Louisiana State Board of Practical Nurse Examiners.

Units of Instruction:

I. Basic Nursing Skills
II. Advanced Nursing Skills
III. Microbiology
IV. Nutrition and Diet Therapy
V. Pharmacology
VI. Intravenous Therapy
VII. Maternal and Infant Care
VIII. Pediatrics
IX. Psychiatrics
X. Medical-Surgical Skills
XI. Career Readiness

Curriculum Competency Outline

UNIT I: Basic Nursing Skills

Competencies:

1. Discuss principles of anatomy and physiology as they relate to nursing care.
2. Perform routine handwashing techniques.
3. Use correct body mechanics.
4. Operate hospital beds and position side rails.
5. Explain and position call signal.
6. Maintain therapeutic environment including adequate light, cleanliness, appropriate temperature, privacy, safety, and diversional activities.
7. Turn/position client in bed.
8. Maintain body alignment.
9. Assist client with coughing and deep breathing exercises.
10. Perform passive and assist with active range of motion exercises.
11. Assist client to ambulate, to stand, to bedside chair, to wheelchair, and to stretcher.
12. Assist in ambulation with walkers, crutches, canes, walking casts, braces, and splints.

13. Use special lift devices.
14. Assist the falling client.
15. Administer baths including bed, tub, shower, medicated, and sitz.
16. Perform measures which reduce body temperature.
17. Perform skin care.
18. Perform nail care including cleaning, trimming, and cuticle care.
19. Perform hair care including combing, shampooing, and shaving.
20. Perform oral and denture care.
21. Dress/groom the client.
22. Assist with meals.
23. Perform bed making including unoccupied (open, closed, and surgical) and occupied (side-to-side and head-to-toe).
24. Assist with elimination using bedpan, fracture pan, urinal, bedside commode, and bathroom.
25. Assist with stimulation of urination.
26. Strain urine.
27. Measure and record intake and output.
28. Obtain and care for specimens of urine including voided, clean catch, catheterized, 24-hour, and from indwelling catheter.
29. Collect and care for specimens of vomitus, sputum, and feces.
30. Test urine for glucose using Clinitest, Dextrostix, and Testape.
31. Test urine for acetone using Ketostix and Acetest.
32. Perform glucose testing on blood.
33. Measure height.
34. Measure weight using floor, bed, and chair scales.
35. Apply restraints and monitor client.
36. Measure temperature using glass and electronic thermometers.
37. Measure apical, carotid, radial, femoral, pedal, and apical-radial pulses.
38. Measure blood pressure using mercury gauge, aneroid gauge, auscultation, and palpation.
39. Observe and record respiration.
40. Perform cardiopulmonary resuscitation (CPR) on infant, child, and adult according to American Heart Association Standards.
41. Provide basic first aid.
42. Arrange for clergy's visit at client's request.
43. Use appropriate communication skills with client and health care team members.
44. Provide post-mortem care.

UNIT II: Advanced Nursing Skills

Competencies:

1. Admit client to agency.
2. Orient to room, unit, and agency.
3. Explain and enforce hospital regulations.
4. Observe client Bill of Rights.
5. Inventory personal property.
6. Obtain nursing history.
7. Perform nursing assessment including: (a) auscultation of heart, breath, and bowel sounds; (b) observation of skin color, tone, and temperature; and (c) assessment of peripheral circulation, joint range of motion, motor skills, and neurological vital signs.
8. Discharge client to home, morgue, and against medical advice.
9. Transfer client within and to another agency.
10. Document observations and nursing care on appropriate records.
11. Transcribe physician's orders.
12. Assist the Registered Nurse (R.N.) in planning nursing care.
13. Assist the R.N. in discharge planning.
14. Apply male external urinary devices.

15. Insert and remove male and female urinary catheters including straight and indwelling.
16. Administer catheter care.
17. Perform intermittent bladder irrigations.
18. Monitor continuous bladder irrigations.
19. Assess for and remove fecal impactions.
20. Administer enemas including medicated, nonmedicated, and flushes.
21. Insert and remove rectal tubes.
22. Perform ostomy care including application of devices, skin care, irrigation, and client teaching.
23. Insert, maintain, and remove nasogastric tube prior to gavage.
24. Verify placement of nasogastric tube prior to gavage.
25. Perform gastric gavage via nasogastric tube and via gastrostomy tube.
26. Maintain patency of gastrostomy tube.
27. Assist with gastric lavage.
28. Assist with maintaining gastro-intestinal decompression.
29. Perform oral, nasal, nasopharyngeal, and endotracheal suctioning.
30. Perform postural drainage.
31. Instruct and assist client to use incentive spirometer.
32. Perform tracheostomy care including inflation and deflation of cuffed tube; removing, cleaning, and reinserting inner cannula; and changing ties.
33. Assist R.N. in instruction of tracheostomy care to client/family.
34. Perform nonmedicated irrigations to throat/mouth, eye, ear, nose, and vagina.
35. Apply hot and cold compresses.
36. Apply ice packs, heating pads, and hypo/hyperthermia blankets.
37. Administer soaks.
38. Apply heat lamp.
39. Administer oxygen therapy including: (a) attaching flow meter to wall outlet and portable tank; (b) regulating liter flow; (c) determining percentage of oxygen delivered; (d) filling and attaching oxygen humidifier; (e) using a catheter, cannula, venturi mask, face mask, tent/hood, and rebreathing mask; and (f) maintaining fire/safety precautions during administration.
40. Assist physician with physical examinations, diagnostic tests, and special procedures including paracentesis, thoracentesis, lumbar puncture, bone marrow aspiration, biopsies, and pelvis examination.
41. Position in Fowler's, semi-Fowler's, Sims', prone, supine, Trendelenburg, lateral and knee-chest.
42. Give and receive end-of-shift report.
43. Utilize the nursing process in the delivery of nursing care.

UNIT III: Microbiology

Competencies:

1. Discuss principles of microbiology as they relate to nursing care.
2. Prepare and maintain an isolation unit.
3. Use appropriate isolation techniques including masking/unmasking, gowning/removing gown, gloving/removing sterile and unsterile gloves.
4. Maintain isolation techniques/precautions in accordance with defined policies and procedures as recommended by the Centers for Disease Control (CDC).
5. Provide nursing care to client in isolation including: (a)personal hygiene, elimination, and nutrition; (b) measuring vital signs; (c) collecting routine specimens; and (d) obtaining specimens for culture from nose, throat, sputum, skin, wounds, urine, feces, ear, eye, and vagina.
6. Dispose of linens, garbage, waste products and other contaminated articles.
7. Assist in disinfection and sterilization procedures.
8. Perform diagnostic skin testing.
9. Administer immunizing agents.

UNIT IV: Nutrition and Diet Therapy

Competencies:

1. Explain principles of nutrition and diet therapy as they relate to nursing care.
2. Assess for food allergies.
3. Assist client in selecting foods.
4. Interpret nutritional values of foods.
5. Evaluate suitability of meals served.
6. Identify clients at nutritional risk.
7. Prepare client for meals, assist with feeding meals, and provide between-meal nourishment.
8. Serve and collect dietary trays.
9. Evaluate and record dietary intake.
10. Reinforce good nutritional health instructions.
11. Identify the components of the major therapeutic diets.
12. Plan a nutritionally adequate diet for a 24-hour period.

UNIT V: Pharmacology

Competencies:

1. Discuss principles of pharmacology as they relate to nursing care.
2. Obtain client's medication history.
3. Observe and record drug allergies.
4. Evaluate medication orders for accuracy, appropriateness for diagnosis, dosage, and route.
5. Calculate drug dosages.
6. Prepare medications from stock and unit dose.
7. Administer and document the administration of oral, buccal, sublingual, topical, and subcutaneous medications.
8. Administer and document the administration of intramuscular medications including vertical insertion in the deltoid, gluteal, ventrogluteal, and vastus lateralis muscles and Z-track insertion.
9. Administer and document administration of medicated enemas and rectal, vaginal, and urethral suppositories.
10. Administer and document administration of inhalation, eye, and ear medications.
11. Document nonadministration of medications.
12. Observe and record client's response to drug therapy.
13. Report and document variances in medication administration.
14. Inventory and requisition stock drugs, client's medications, and controlled substances.
15. Document disposal of unused controlled substances.
16. Store drugs under correct conditions.
17. Assist in instruction of self-administration of medications including dosage, route and schedule, intended actions, contraindications, and adverse reactions.
18. Identify classes, uses, actions, and side effects of commonly used medications.

UNIT VI: Intravenous Therapy

Competencies:

1. Discuss principles of intravenous therapy as they relate to nursing care.
2. Monitor and maintain infusions by regulating flow manually and mechanically, checking for patency, and obtaining intravenous claim.
3. Discontinue intravenous needles and catheters.
4. Observe and provide site care.
5. Hang unmedicated, medicated, and electrolyte solutions.
6. Change infusion tubing.
7. Perform Heparin-lock maintenance.
8. Monitor blood transfusions including rate and reactions.
9. Assist with phlebotomy.
10. Monitor central venous lines.
11. Document administration of fluids and nursing care performed.
12. Calculate IV flow rates in milliliters (ml) per hour, ml per minute, and drops per minute.

UNIT VII: Maternal and Infant Care

Competencies:

1. Discuss principles of maternal and infant care as they relate to nursing care in the perinatal period.
2. Identify and provide for educational needs of the expectant mother.
3. Assist with obstetrical examinations including height, weight, blood pressure, fetal heart tones, fundal height, and examinations of blood and urine.
4. Monitor uterine contractions manually and mechanically.
5. Measure and record fetal heart beat with fetoscope and ultrasonic device.
6. Attach and observe maternal-fetal monitor.
7. Assist with perineal preparation.
8. Observe and document progress of labor.
9. Assist with vaginal delivery.
10. Assist with care of newborn after delivery including initiating and maintaining airway care, performing routine identification, and maintaining body temperature.
11. Observe delivery by Cesarian Section.
12. Provide postpartal assessment of fundal height, lochia, perineum, episiotomy, bladder, and breasts.
13. Administer perineal care including cleansing, light, sitz bath, anesthetic sprays, and medicated pads.
14. Instruct client in self-administration of perineal care.
15. Assist client and instruct in breast feeding including feeding techniques, care of nipples, diet, and use of breast pump.
16. Maintain therapeutic environment in the nursery including cleanliness, appropriate temperature, adequate light and humidity, and safety precautions.
17. Perform handwashing techniques according to prescribed perinatal policy.
18. Admit newborns to nursery including giving eye care and cord care and administering vitamin K injections.
19. Perform newborn baths.
20. Perform newborn initial assessment including weight, length, head circumference, chest circumference, vital signs, skin condition, and review of systems.
21. Perform newborn care including cord care, clothing, and diapering.
22. Lift, hold, and position newborns.
23. Administer feedings.
24. Observe voidings and stools.
25. Assist with testing for glucose and phenylketonuria.
26. Provide care for newborn receiving phototherapy, radiant heat, and following circumcision.
27. Assist with birth registration.
28. Discharge infant from nursery.
29. Document nursing care performed.

UNIT VIII: Pediatrics

Competencies:

1. Discuss principles of pediatric care.
2. Assist with admission procedures.
3. Feed pediatric client.
4. Measure and record intake and output.
5. Apply and monitor restraints.
6. Collect specimens of urine via pediatric collector and stool via diaper.
7. Assist with oxygen therapy including coupette/croup tent, hood, and humidifier.
8. Apply, observe and document use of cardio-respiratory monitor.
9. Assist with care of non-toilet trained infant in a body cast.
10. Calculate, administer, and monitor pediatric oral, intramuscular, rectal, and topical medications.
11. Administer eye, ear, and nose medications.

12. Monitor intravenous therapy.
13. Identify and report situations with potential for child abuse or neglect.
14. Document nursing care provided.

UNIT IX: Psychiatrics

Competencies:
1. Discuss concepts of mental health and mental illness as they relate to nursing care.
2. Maintain a safe environment by monitoring use of potentially abusive objects and substances.
3. Identify and minimize environmental stressors.
4. Assess physical and emotional status of clients.
5. Develop and maintain a therapeutic relationship utilizing effective communication skills.
6. Assist with referral of clients experiencing mental and emotional problems to available community resources.

UNIT X: Medical-Surgical Skills

Competencies:
1. Discuss principles of nursing care for adults experiencing disturbances in one or more body systems..
2. Provide preoperative care including: (a) psychological preparation for client and family; (b) assistance in preoperative instruction; and (c) providing physical preparation including assessment, skin prep, bowel prep, personal hygiene, and preoperative medications.
3. Assess for appropriate documentation on preoperative chart/record.
4. Inventory and protect clients' possessions.
5. Provide postoperative care including: (a) airway maintenance; (b) positioning; (c) care of tubes, drains, incisions, and dressings; and (d) assessment for complications.
6. Initiate and maintain cardiac monitoring.
7. Provide and monitor care for clients in skin and skeletal traction.
8. Provide cast care including neurovascular assessment, care of wet and dry casts, and handling.
9. Provide physical and psychological care for the dying client.
10. Provide emotional support for the family of the dying client.
11. Assist in the care of clients with chest tubes.
12. Assist client experiencing respiratory and/or cardiac arrest using code protocol.
13. Discuss the principles of aging as they relate to nursing care delivery in the community and long-term care setting.
14. Reinforce bowel and bladder training.
15. Utilize techniques of reality orientation.
16. Utilize communication skills appropriate to dealing with the sensory impaired elderly.
17. Identify the most common accidents and illnesses occurring in the aging population.
18. Discuss theories of aging.
19. Identify potential dietary problems of the aging related to disease as well as the normal process of aging.
20. Identify body system changes that occur with normal aging.
21. Identify psycho-social changes and problems that occur with normal aging.
22. Describe how societal attitudes, including the care givers' attitudes, impact on the aging.
23. Describe ways the aging may be subjected to physical and emotional abuse.
24. Identify common prejudices and stereotypes that the young hold for the aging.
25. Identify myths related to sexuality in the aging.

UNIT XI: Career Readiness

Competencies:
1. Explain procedures for obtaining and renewing license to practice.
2. Describe the role of the Practical Nurse as a member of the health care team and demonstrate the ability to differentiate the roles and responsibilities of all team members.

3. Assign and supervise ancillary staff in a stable situation.
4. Promote public relations within the work place.
5. Prepare a personal resume'.
6. Complete a job application.
7. Participate in a mock job interview.
8. Describe the procedure for resignation and write a letter of resignation.
9. Discuss Equal Opportunity Employment Provisions and Affirmative Action policies within the work place.
10. Demonstrate moral, legal, and ethical standards to which nurses must adhere.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Health Occupations **Course Title:** Respiratory Therapy Technician

CIP Code: 17.0819 **Course Length** 1575 Clock Hours - 14 Months

Course Description:

This course prepares students for employment in health care facilities where they will administer general respiratory care under the supervision of a respiratory therapist and/or a physician.

The needed knowledge and skills are acquired through classroom instruction, laboratory experiences, and clinical applications. Included are the areas of anatomy and physiology of respiration, fundamentals of respiratory care, use of equipment, microbiology, drugs, chest diseases, basic and advanced clinical procedures, and employment preparation. A high school diploma or equivalent is required to enter this competency-based course.

Units of Instruction:
I. Anatomy and Physiology
II. Fundamentals
III. Microbiology
IV. Pharmacology
V. Chest Diagnosis and Diseases
VI. Basic Clinical Procedures
VII. Physiology of Respiration
VIII. Advanced Respiratory Therapy
IX. Advanced Clinical Procedures
X. Cardiopulmonary Evaluation
XI. Employment Preparation

Curriculum Competency Outline

UNIT I: Anatomy and Physiology

Competencies:
1. Identify the major systems of the body.
2. Identify the major parts of a cell.
3. Identify the major types of tissue.
4. Identify the layers of the epidermis.
5. Identify the functions of the skin.
6. Identify the bones and functions of the skeletal system.
7. Identify the major thoracic skeletal deformities that can affect respiration
8. Identify the types of muscular tissue.
9. Identify muscular disorders.
10. Identify the basic structure of the heart.
11. Identify the major blood vessels which supply blood to the heart muscle.
12. Identify mechanisms that regulate blood pressure.
13. Diagram the flow of electrical current through the heart.
14. Identify abnormalities and treatment of heart diseases.
15. Identify the components of the pulmonary system and give their functions.

16. Identify the histologic structure of the mucosa.
17. Identify lung volumes and capacities.
18. Identify the mechanisms of oxygen and carbon dioxide diffusion.
19. Identify the divisions of the nervous system.
20. Identify the components and mechanisms of nerve conduction.
21. Identify the parts of the digestive system and give their functions.
22. Identify the glands of the endocrine system and give their functions.
23. Identify the major parts of the renal system and give their functions.
24. Identify the mechanisms controlling distribution of water between the blood and the interstitial compartments.
25. Identify the types of edema and their characteristics.
26. Compare the roles of the lungs and kidneys in acid-base regulation.

UNIT II: Fundamentals

Competencies:

1. Identify the major functions of the respiratory therapy department.
2. Identify prefixes used in the metric system.
3. Calculate metric and customary units.
4. Write the mathematical formulas pertinent to gas laws.
5. Identify the markings and color codings on a compressed gas cylinder.
6. Describe and use wall outlets and piping system connections.
7. Identify and use flow-regulating devices.
8. Identify and use high pressure cylinder gas regulators.
9. Identify oxygen therapy equipment.
10. Give the indications for oxygen therapy, helium therapy, and carbon dioxide therapy.
11. Describe the types of oxygen analyzers.
12. Measure oxygen concentration.
13. Set up an oxygen blender to deliver desired oxygen concentrations.
14. Identify Bernoulli's principle.
15. Identify the goal of aerosol therapy.
16. List the clinical uses of aerosol and humidity therapy.
17. Identify the types of humidifiers and nebulizers in common clinical use.
18. Set up the types of humidifiers and nebulizers.
19. Identify the goals of incentive spirometry.
20. Identify the steps in administration of incentive spirometry.
21. Identify the clinical goals of intermittent positive pressure breathing.
22. Describe the mechanical operations of the Bennett and the Bird respirators.
23. Perform chest percussion, vibration, postural drainage and expansion exercises.
24. Describe methods used to overcome upper airway obstruction.
25. Identify oropharyngeal and nasopharyngeal airways.
26. Identify the steps involved in suctioning the airway.
27. List the steps involved in changing a tracheostomy tube.
28. Identify the steps involved in tracheostomy care.
29. List the indications for intubation.

UNIT III: Microbiology

Competencies:

1. Identify major structures of bacterial cells.
2. Identify the essential elements for bacterial growth.
3. Identify the disease defense systems of the body.
4. Classify microorganisms.
5. Identify pyogenic cocci and the diseases they cause.
6. Identify aerobic and anerobic microorganisms and the diseases they cause.
7. Identify Enterobacteriaceae and Mycobacteria and the diseases they cause.
8. Identify Mycoplasma, Viruses, Rickettsia, and Chlamydia and the diseases they cause.

9. Identify pulmonary fungi and parasites and the diseases they cause.
10. Identify terms and definitions related to disinfection and sterilization.
11. Identify the major methods of disinfection and sterilization and give advantages and disadvantages of each.
12. Identify procedural errors which may lead to cross contamination and patient infection.
13. Identify aseptic techniques.
14. Demonstrate handwashing skills and gowning techniques.
15. Identify solutions used to induce sputum production for laboratory analysis.
16. Identify methods available for histologic diagnosis of pulmonary disease.
17. Perform Infectious Disease Case Study.

UNIT IV: Pharmacology

Competencies:

1. Identify and use the Respiratory Drug Formulary.
2. Calculate dilutions when given desired dosages and concentrations.
3. Relate the nervous system to medications.
4. Identify cardiovascular agents and their actions.
5. Identify bronchodilator agents and their actions.
6. Identify decongestant agents and their actions.
7. Identify mucolytic and proteolytic agents and their actions.
8. Identify anesthetic agents and their actions.
9. Identify skeletal muscle relaxants and their uses.
10. Identify diuretics and their uses.
11. Identify antimicrobial agents and their uses.
12. Identify steroids and their uses.

UNIT V: Chest Diagnosis and Diseases

Competencies:

1. Identify and describe the function of the major respiratory control centers.
2. Describe the effects of hydrogen, oxygen, and carbon dioxide on the regulation of respiration.
3. List the components of physical assessment.
4. List the steps necessary for a systematic approach to auscultation of the neck and chest.
5. Identify normal and adventious breath sounds.
6. Correlate adventious breath sounds with their abnormal states of the lungs.
7. Identify basic components of a normal chest X-ray.
8. Identify special X-ray techniques for respiratory assessment.
9. Identify major respiratory actions compromised by respiratory problems.
10. Identify etiology, pathophysiology and treatment of Chronic Obstructive Pulmonary Disease (COPD).
11. Identify etiology, pathophysiology and treatment of types of Reversible Obstructive Airway Disease (ROAD).
12. Identify causative agents and mode of transmission of pneumonias.
13. Identify the etiology, pathophysiology, and treatment of Pulmonary Edema and Congestive Heart Failure (CHF).
14. Identify the causes of Infant Respiratory Distress Syndrome (IRDS).
15. Identify the causes of Adult Respiratory Distress Syndrome (ARDS).
16. Identify problems associated with Hyaline Membrane Disease.
17. Identify problems associated with Bronchopulmonary Displasia and Respiratory Syncytial Virus (RSV).
18. Identify etiology, pathophysiology, and treatment of Cystic Fibrosis.
19. Identify etiology, pathophysiology, treatment, and mode of transmission of tuberculosis.
20. Identify etiology, pathophysiology, and treatment of chest trauma and pneumothrax.

21. Identify etiology, pathophysiology, and treatment of respiratory failure.
22. Identify etiology, pathophysiology, and treatment of Coronary Artery Disease.
23. Identify respiratory problems associated with burn trauma.

UNIT VI: Basic Clinical Procedures

Competencies:

1. Discuss medical ethics.
2. Identify and use fire extinguishers.
3. List and define symptomatic prefixes and suffixes.
4. Use appropriate body mechanics.
5. Discuss the five stages of dying.
6. Use therapeutic communication skills.
7. Perform basic nursing skills.
8. Perform one- and two-man Cardiopulmonary Resuscitation (CPR) on an adult.
9. Perform CPR on an infant.
10. Set up, transport and discontinue cylinders of compressed gas.
11. Attach regulators and flow meters to the gas sources.
12. Select and assemble the materials needed to provide oxygen via various delivery devices.
13. Identify drugs commonly used in respiratory therapy.
14. Fill and operate an aerosol generator for continuous and intermittent use.
15. Set up equipment and instruct patient in Incentive Spirometry techniques.
16. Assemble equipment and administer IPPB therapy using Bennett and Bird respirators.
17. Position patient to drain all bronchopulmonary segments.
18. Perform manual percussion and vibration.
19. Perform bag and mask ventilation.
20. Perform suction procedures.
21. Change inner tracheostomy cannula and give stoma care.
22. Perform endotracheal intubation and extubation.

UNIT VII: Physiology of Respiration

Competencies:

1. Trace the complete airflow pattern into and out of the lungs.
2. List and define the concepts of lung capacity and volume measurements.
3. Describe the process of pulmonary mechanics.
4. Describe the normal distribution of gases and uneven distribution of gases.
5. Describe the gas transfer in the lungs.
6. Describe the relationship of compliance and dynamic recoil of the lungs.
7. Define and measure airway resistance.
8. Discuss acid-base homeostasis.
9. Discuss oxygen transport in the blood.
10. Discuss carbon dioxide transport in the blood.
11. Discuss respiratory tract defenses.
12. Discuss fetal to neonatal circulation and initiation of breathing.

UNIT VIII: Advanced Respiratory Therapy

Competencies:

1. Identify normal blood gas values.
2. Identify hypoxia and its causes.
3. Discuss the role and responsibilities of Respiratory Therapy Technicians during CPR.
4. Identify emergency airway maintenance equipment.
5. Identify cardia dysrhythmias from Electrocardiograph (EKG) Tracings.
6. Identify and operate positive and negative pressure ventilators.
7. Identify and operate pressure and volume ventilators.
8. Identify symptoms of common malfunctions of ventilators and their causes.
9. Identify the indications, contraindications, and the hazards of mechanical ventilation.

10. Identify the effects and complications of mechanical ventilation.
11. Identify measureable parameters needed to wean a patient from a ventilator.
12. Identify minimum criteria for each parameter.
13. Identify weaning techniques and devices.
14. Identify anatomical differences between infants and adults.
15. Identify flow characteristics of pediatric ventilators.
16. Locate arterial puncture sites.
17. Identify procedures for handling blood gas samples.
18. Identify normal values for pressure in the heart and blood vessels.
19. Identify techniques for home care patients.

UNIT IX: Advanced Clinical Procedures

Competencies:

1. Prepare blood samples for blood gas analysis.
2. Perform quality control procedures on clinical instrumentation.
3. Measure, record, and evaluate vital signs and respiratory parameters.
4. Connect a circuit to a volume ventilator.
5. Set up and operate pressure ventilators.
6. Monitor a mechanical ventilator in continuous use.
7. Make changes in ventilatory settings to wean patient from mechanical ventilator.
8. Set up and operate infant ventilators.
9. Perform procedures for handling arterial blood samples.
10. Instruct patient in techniques of home care.

UNIT X: Cardiopulmonary Evaluation

Competencies:

1. Identify pulmonary function test procedures and give normal values.
2. Identify pulmonary mechanics test procedures and give normal values.
3. Identify gas distribution test procedures and give normal values.
4. Identify diffusion test procedures and give normal values.
5. Identify ventilation blood flow test procedures and give normal values.
6. Identify components of hemodynamics.
7. Identify uses of Swann-Gans catheter.
8. Perform arterial line and Swann-Gans catheter calibrations.
9. Identify methods of determining noninvasive cardiac functions.

UNIT XI: Employment Preparation

Competencies:

1. Explain the procedure for obtaining and renewing a license to practice.
2. Describe the role of the Respiratory Therapy Technician relating to legal responsibilities.
3. Prepare a personal resume'.
4. Complete a job application.
5. Describe procedure for resignation.
6. Write a letter of resignation.
7. Participate in a mock interview.
8. Discuss Equal Opportunity Employment provisions and Affirmative Action policies in the work place.
9. Promote public relations within the work place.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Health Occupations

Course Title: Surgical Technology

CIP Code: 17.0211

Course Length 1575 Clock Hours - 14 Months

Course Description:

This course prepares students to set up operating room equipment and supplies for surgery as well as assist the physician during surgical procedures. Students receive classroom instruction and clinical experiences in accredited hospitals under the supervision of registered nurses and instructors.

A high school education or equivalent is required for admission to this competency-based course. Classroom instruction includes microbiology, anatomy and physiology, safety, pharmacology, instrumentation and surgical procedures.

Units of Instruction:

I. Introduction to Surgical Technology
II. Anatomy and Physiology
III. Microbiology
IV. Aseptic Techniques
V. Pharmacology
VI. Patient Care and Safety
VII. Supplies and Equipment
VIII. Surgical Procedures
IX. Employment Preparation

Curriculum Competency Outline

UNIT I: Introduction to Surgical Technology

Competencies:

1. Define surgical technology.
2. Demonstrate communication skills.
3. Discuss legal, ethical, and historical aspects of surgery.
4. Interpret medical terms and abbreviations.
5. Discuss the operating room environment.

UNIT II: Anatomy and Physiology

Competencies:

1. Describe the organization of the body.
2. Discuss cells, tissues, and membranes.
3. Identify and discuss structure, location, function and blood supply of: integumentary system, skeletal system, muscular system, nervous system, special sense organs, digestive system, circulatory system, respiratory system, reproductive system, urinary system, and endocrine system.

UNIT III: Microbiology

Competencies:

1. Define and classify microorganisms.
2. Describe the infectious process.
3. Describe the immune response.
4. Describe the process of wound healing.

UNIT IV: Aseptic Techniques

Competencies:

1. Define principles and concepts of aseptic techniques.
2. Perform scrubbing, gowning, and gloving techniques.
3. Discuss and perform sterilization and disinfection methods and procedures.

UNIT V: Pharmacology

Competencies:

1. Solve problems relating to weights amd measures.
2. Calculate dosage of medications.
3. Classify drugs according to their use in surgery.
4. Define and discuss types of anesthesia.

UNIT VI: Patient Care and Safety

Competencies:

1. Perform related health care skills.
2. Demonstrate ability to facilitate preoperative routines.
3. Perform positioning, prepping, and draping for intraoperative procedures.
4. Perform surgical counts.
5. Differentiate between pediatric and geriatric special precautions.
6. Perform CPR on adults and infants.
7. Discuss death and dying.
8. Discuss emergency practices and procedures.
9. Obtain and identify specimens.

UNIT VII: Supplies and Equipment

Competencies:

1. Discuss and demonstrate the use of operating room furniture and accessory equipment.
2. Identify, assemble equipment, and perform skills related to the following: instrumentation; sutures and needles; sponges, dressings, and packings; catheters, drains, tubes, and collecting mechanisms; and syringes and hypodermic needles.

UNIT VIII: Surgical Procedures

Competencies:

1. Identify goals and reasons for surgical intervention.
2. Identify types of intraoperative complications.
3. Establish and maintain a sterile field.
4. Discuss and perform procedures related to general surgery to include the following: herniorrphy, thyroidectomy/parathyroidectomy, and breast surgery.
5. Discuss and perform procedures related to the following: gastrointestinal surgery; obstetrics and gynecology surgery; genitourinary surgery; head and neck surgery; plastic/reconstructive surgery; ophthalmic surgery; orthopedic surgery; neurosurgery; thoracic surgery; and cardiovascular/peripheral vascular surgery.

UNIT IX: Employment Preparation

Competencies:

1. Explain procedure for obtaining and renewing certification to practice.
2. Describe the role of the surgical technician relating to legal responsibilities.
3. Prepare a personal resume'.
4. Complete a job application.

5. Participate in a mock job interview.
6. Describe procedure for resignation.
7. Write a letter of resignation.
8. Promote public relations within the workplace.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education
Competency-Based Course Outline

Program Area: Health Occupations **Course Title:** Ward Clerk

CIP Code: 17.0513 **Course Length** 338 Clock Hours - 3 Months

Course Description:

This course prepares students for assistant management positions of responsibility in hospital nursing units. The ward clerk performs non-nursing managerial functions on the nursing unit under the direct supervision of the head nurse.

Included in the classroom instruction are management of a safe environment, equipment and supplies, clerical assistance with records and reports, coordination of activities of the nursing unit with other departments, medical terminology, transcription procedures, and performance of receptionist duties. This is a competency-based course.

Units of Instruction:
I. Orientation and Introduction
II. Medical Terminology
III. Communications
IV. Transcription Procedures
V. Employment Preparation

Curriculum Competency Outline

UNIT I: Orientation and Introduction

Competencies:
1. Identify the purposes of Health Care Institutions.
2. Identify the organizational structure within the Health Care Institution and the Health Care Team.
3. Identify the roles and responsibilities of each member of the Health Care Team.
4. Identify the duties and responsibilities of the ward clerk.
5. Identify standards of ethical and professional behavior.
6. Exhibit good personal grooming and hygiene practices.
7. Identify and use appropriate communication and observation skills.
8. Identify potential hazards in home and health care environments and procedures.
9. Demonstrate fire safety procedures.
10. Prevent cross contamination by using appropriate handwashing techniques.
11. Identify and use techniques of good body mechanics.
12. Perform cardiopulmonary resuscitation (CPR).
13. Identify the major types of patients.
14. Exhibit understanding, tact, and competence when working with patients and families.
15. Explain the legal responsibilities of the ward clerk.
16. Explain the religious practices that may be encountered.
17. Demonstrate appropriate use of station equipment.
18. Maintain patient charts and records.
19. Record legibly and spell correctly on all records.
20. Assist with training new ward clerk employees.
21. Monitor dietary trays for content and accurate distribution.

22. Route lost and found articles to appropriate department.
23. Maintain and record daily census.
24. Order, maintain, and credit patient and unit supplies.
25. Assist with completion of necessary consent forms.
26. Assist with completion of accident/incident report forms.

UNIT II: Medical Terminology

Competencies:

1. Identify the purposes of using medical terminology.
2. Identify the word elements used to compose medical terms.
3. Demonstrate appropriate use of medical terms and the medical dictionary.
4. Use accepted abbreviations and symbols.
5. Pronounce and spell medical terms correctly.

UNIT III: Communications

Competencies:

1. Identify the purposes of the major departments within the Health Care Institution.
2. Describe how the ward clerk interfaces with other departments in the institution.
3. Discuss the importance of patients' needs, rights, and dignity.
4. Discuss the importance of good judgement in dealing with patients, families, personnel, and physicians.
5. Answer and use the telephone and the intercom courteously.
6. Receive and relay messages promptly and accurately.
7. Requisition supplies and equipment as needed.
8. Assist with admission, transfer, and discharge procedures.

UNIT IV: Transcription Procedures

Competencies:

1. Identify the purposes of physicians' orders and transcription procedures.
2. Discuss legal aspects of physicians' orders.
3. Complete requisitions and route to appropriate departments.
4. Identify the effects of errors in transcribing physicians' orders.
5. Enter patient data into computer.
6. Identify and perform appropriate transcription procedures for all items included in the physicians' orders.
7. Make clinic appointments for patients when necessary.

UNIT V: Employment Preparation

Competencies:

1. Describe career advancement opportunities.
2. Complete a job application.
3. Describe procedure for resignation.
4. Write a letter of resignation.
5. Participate in a mock interview.
6. Discuss Equal Opportunity Employment provisions and Affirmative Action policies in the work place.
7. Promote loyalty and confidentiality within the work place.
8. Promote good public relations in the work place.

HOME ECONOMICS

Child Care
Commercial Sewing
Culinary Occupations
Dietary Manager
Homemaker's Aide

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Home Economics **Course Title:** Child Care

CIP Code: 20.0201 **Course Length** 1350 Clock Hours - 12 Months

Course Description:

This program prepares individuals for entry-level, assistant, and management levels of employment in day care centers, nursery schools, recreation centers or other areas where caring for young children is the principal function. This course of study focuses on normal physical, emotional, and social growth and development. Appropriate play activities, nutrition, guidance and discipline, safety, and approaches for teaching children are also included.

Supervised laboratory or work experience is included as an important part of the curriculum. The content is organized into competency-based units of instruction and specifies occupational competencies that the student must successfully complete.

Units of Instruction:

I. Introduction to Child Care
II. Prenatal and Infant Growth and Development
III. Toddler and Preschool Growth and Development
IV. School Age and Adolescent Growth and Development
V. Guidance and Discipline
VI. Early Childhood Curriculum and Laboratory
VII. Nutrition and Health
VIII. Teaching Young Children and Laboratory
IX. Administration and Supervision of Early Childhood Programs
X. Family Relationships and Issues
XI. Children With Exceptionalities
XII. Employment Preparation

Curriculum Competency Outline

UNIT I: Introduction to Child Care

Competencies:

1. Define the child care profession.
2. Identify personal qualities needed by a child care giver.
3. Identify career opportunities.
4. Identify types of child care programs.
5. List characteristics of a good quality child care program.
6. Discuss licensing requirements.
7. Identify safety hazards.

UNIT II: Prenatal and Infant Growth and Development

Competencies:

1. Identify and explain the functions of the reproductive system.
2. Explain the process of conception and methods of family planning.

3. Discuss the importance of prenatal care.
4. Identify the stages of prenatal development.
5. Explain the birth process.
6. Explain the social, physical, emotional, and intellectual needs of an infant from birth to 12 months.
7. Demonstrate appropriate techniques for holding the infant, diapering, feeding, dressing and sleeping.
8. Prepare a growth and development activity file for infants.
9. Identify, select, and make appropriate play materials.
10. Chart the social, physical, emotional, and intellectual development of an infant from birth to 12 months.
11. Evaluate total development of the infant from birth to 12 months.
12. Identify appropriate guidance techniques.
13. Describe infant intellectual and language developments by noted authorities in the field.
14. Identify special needs of infants in a group setting.

UNIT III: Toddler and Preschool Growth and Development

Competencies:

1. Identify and explain social, physical, emotional, and intellectual needs of a toddler (age 12-36 months) and a preschooler (age 3 to 5 years).
2. Describe and demonstrate how toddlers and preschoolers learn routines and self-help skills such as toileting, preparing for nap time, dressing and eating.
3. Identify special needs of toddlers and preschoolers in the group setting.
4. Identify appropriate toddler and preschooler guidance techniques.
5. Prepare a growth and development activity file for toddlers and preschoolers.
6. Identify, select, and make appropriate play materials for toddlers and preschoolers.
7. Identify hazards to the safety of toddlers and preschoolers.
8. Describe toddler and preschool intellectual language developments by noted authorities in the field.
9. Identify common language problems.
10. Evaluate total development of toddlers and preschoolers.
11. Chart the social, physical, emotional, and intellectual development of toddlers and preschoolers.

UNIT IV: School Age and Adolescent Growth and Development

Competencies:

1. Identify and explain social, physical, emotional, and intellectual needs of a school age child (age 6-12 yrs.) and an adolescent (age 13-adult).
2. Describe and demonstrate how school-age children and adolescents learn routines and self-help skills for personal needs.
3. Identify special needs of school-age children and adolescents in group settings.
4. Identify appropriate guidance techniques.
5. Prepare a growth and development activity file.
6. Identify, select, and make appropriate play materials.
7. Establish and maintain a safe and healthy environment.
8. Describe intellectual and language development by noted authorities in the field.
9. Identify common language problems.
10. Evaluate total development of school-age children and adolescents.
11. Identify programs for school-age children and adolescents.
12. Identify and discuss special problems in social and emotional development of school-age children and adolescents.

UNIT V: Guidance and Discipline

Competencies:

1. Define guidance and discipline.
2. Explain the self-control approach to discipline.

3. List ways to effectively communicate with children.
4. Recognize and use positive statements in dealing with children.
5. Explain the use of imitation and reinforcement in dealing with behavior.
6. Show how removing the causes of misbehavior and providing a suitable environment are helpful.
7. Identify the reasons for specific behaviors.
8. Choose correct ways to handle situations involving: freedom of expression, giving choices, setting and enforcing limits, and handling special problems.

UNIT VI: Early Childhood Curriculum and Laboratory

Competencies:

1. Identify curriculum areas.
2. Identify, select, and make appropriate curriculum materials in the areas of science, mathematics, language, literature, creative art, music, dramatic play, cooking, outdoor play, creative movement, manipulatives, health and safety, social studies, woodworking, and carpentry.
3. Identify the value of the curriculum areas.
4. Identify the importance and value of play and creativity.
5. Plan and demonstrate learning activities in the identified curriculum areas.
6. Make a curriculum resource file.
7. Describe the role of the teacher or care giver in facilitating children's play.

UNIT VII: Nutrition and Health

Competencies:

1. Explain the importance of good nutrition.
2. List the four food groups and identify foods found in each group.
3. Identify nutritional needs during pregnancy, breast feeding, infancy, toddler, preschooler, school-age child, and adolescent.
4. Plan and write menus for all children.
5. Demonstrate appropriate sanitation practices and food storage, preparation, serving, and clean-up.
6. Prepare nutritious snacks for children.
7. Teach a nutrition class to the children.
8. Make a nutrition file.
9. Discuss appropriate meal-time routines.
10. Identify measures to prevent disease in a group setting.
11. Name the immunizations commonly required for entrance into a child care center.
12. Discuss communicable diseases in children.
13. Identify the signs of illness in children.
14. Outline the steps to be taken when a child becomes ill.
15. Perform basic first aid procedures including cardiopulmonary resuscitation (CPR).
16. Identify and remove health hazards.

UNIT VIII: Teaching Young Children and Laboratory

Competencies:

1. Discuss theories of learning.
2. Define goals and objectives.
3. Write program goals and objectives.
4. Write lesson plans to include goals, objectives, materials, procedures, and evaluation.
5. Develop a complete teaching resource unit.
6. Prepare and conduct a learning experience from the resource unit.
7. Develop yearly, monthly, weekly, and daily curriculum plans for an early childhood education program.

UNIT IX: Administration and Supervision of Early Childhood Programs

Competencies:

1. Formulate goals and objectives of a child care program.
2. Identify desirable characteristics of the physical plant.
3. Identify staffing requirements.
4. Plan operating budget.
5. Identify types of procedures of record keeping.
6. Select equipment.
7. Formulate program policies for staff, children, and parents.
8. Describe ways that parents can become involved in the program.
9. Describe methods for effective communications with parents and staff.
10. Identify laws and regulations which apply to opening a child care center.
11. Make a list of agencies, professional organizations, and publications relating to child care.

UNIT X: Family Relationships and Issues

Competencies:

1. Define family structures.
2. Discuss behaviors as they relate to the changing family structures.
3. Identify available community resources.
4. Discuss physical and behavioral indicators of child abuse/neglect, legal requirements, and reporting procedures.
5. Discuss changes and transitions in the family environment such as moving, hospitalization, unemployment, death, divorce, and new siblings.
6. Identify parent education programs.

UNIT XI: Children With Exceptionalities

Competencies:

1. Define causes and characteristics of exceptionalities and children who have these exceptionalities.
2. Identify current laws pertaining to children with exceptionalities.
3. Discuss screening and testing.
4. Identify appropriate curriculum for children with exceptionalities.
5. Identify changes in physical environment.
6. List organizations that provide assistance and services for children with exceptionalities.
7. Identify appropriate guidance techniques.

UNIT XII: Employment Preparation

Competencies:

1. Describe the role of the child care giver relating to legal responsibilities.
2. Prepare a personal resume' and a letter of application.
3. Complete a job application.
4. Describe procedure for resignation.
5. Write a letter of resignation.
6. Participate in a mock interview.
7. Discuss medical requirements.
8. Discuss Equal Opportunity Employment provisions and Affirmative Action policies in the work place.
9. Promote public relations within the work place.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Home Economics

Course Title: Commercial Sewing

CIP Code: 20.0303

Course Length 1350 Clock Hours - 12 Months

Course Description:

The Commercial Sewing course prepares students for entry-level positions in areas such as men's and women's alterations, basic clothing construction in a factory or design boutique, and drapery making. Classroom instruction includes personality of fabrics, layout and alteration of patterns, cutting out and assembling garments and draperies, hand and machine stitching, and pressing.

The content is organized into competency-based units of instruction and specifies occupational competencies that the student must successfully complete.

Units of Instruction:

I. Basic Garment Construction
II. Drapery Making
III. Employment Preparation

Curriculum Competency Outline

UNIT I: Basic Garment Construction

Competencies:

1. Discuss the job markets, working conditions, and salaries.
2. Identify types of machines used such as sewing machine, serger machine, and blind stitcher machine.
3. Read and understand operation manual of each machine.
4. Perform tasks listed in operation manual.
5. Adhere to safety regulations for each machine.
6. Identify and use measuring tools and equipment.
7. Identify and use cutting tools and equipment.
8. Identify and use marking tools and equipment.
9. Identify and use pressing tools and equipment.
10. Care for tools and equipment properly.
11. Adhere to safety precautions when using all tools and equipment.
12. Learn natural and man-made fabric contents.
13. Identify woven and knitted fabrics.
14. Identify fabric compatibility.
15. Identify fabrics that require serging.
16. Identify label and tag requirements.
17. Greet the customers.
18. Measure the customer.
19. Obtain and interpret customer requests.
20. Prepare the fabric by preshrinking when necessary, straightening the grain, and identifying the cutting direction.
21. Read pattern guidesheet.
22. Make pattern adjustments.
23. Identify right side of fabric.
24. Lay out pattern on fabric according to correct grain and nap.

25. Cut fabric according to layout.
26. Mark construction details on fabric.
27. Identify types of stitches.
28. Identify and perform balanced tension of machine stitching.
29. Determine appropriate type and length of stitch.
30. Identify and perform basic seam types.
31. Stitch seams accurately and consistently.
32. Construct darts, tucks, pleats and gathers.
33. Perform stay stitching, reinforcing, understitching and top stitching.
34. Construct and/or apply facings, interfacings, collars, sleeves, and pockets.
35. Apply closings as listed: fasteners (snaps, hooks and eyes, velcro), zippers, buttons, and make buttonholes.
36. Make casings for drawstrings and elastic.
37. Identify types of hems.
38. Perform hemming techniques.
39. Differentiate pressing qualities of fabrics.
40. Perform progressive and final pressing techniques.
41. Use appropriate pressing tools.
42. Identify alteration tags and markings.
43. Fit garment and mark alterations.
44. Define factors which influence fit of garments.
45. Identify standards of well-fitted garments.
46. Lengthen and shorten, increase and decrease, raise and lower, and relocate construction details.
47. Identify types of interfacing.
48. Construct and apply interfacings, underlinings, and linings.
49. Identify and apply types of trim.
50. Identify types of padding; construct and apply padding.
51. Determine need and apply fray-stopping solution.
52. Pad-stitch a collar and lapel.
53. Grade seam allowances.
54. Shape by using advanced pressing techniques.
55. Stitch and evaluate a four-point closure.

UNIT II: Drapery Making

Competencies:

1. Define basic drapery terminology.
2. Identify window types and styles.
3. Identify parts of a window.
4. Identify drapery hardware and methods of drapery installation.
5. Assess and maintain a safe environment.
6. Identify equipment used for drapery making, such as the work table.
7. Identify and use hand tools as listed:
    - Cutting shears
    - Seam ripper
    - Steel tape measure
    - Needles
    - T-pins
    - Yardstick and rulers
    - Push pins
    - Square
    - Screwdriver
    - Dressmaker pins
    - Iron
    - Ironing board
    - Drapery hangers
    - Staple gun
    - Hot glue gun
    - Tack and claw hammer
    - Wood saw
    - Hacksaw
8. Interpret parts of the work order.
9. Verify fabric specifications as to name, color and amount.
10. Verify measurements and pattern repeat of fabric.

11. Identify and inspect for flaws in fabric.
12. Identify right side of fabric.
13. Identify grain line of fabric.
14. Adjust fabric to square of table if necessary.
15. Cut fabric and lining.
16. Clip and/or remove selvages on panels.
17. Match patterns in fabric and pin panels together.
18. Stitch fabric panels together.
19. Stitch lining panels together.
20. Press side and bottom hems and sew by hand.
21. Insert weights in corners and seams.
22. Press lining hem and stitch.
23. Anchor drapery hem to work table at correct length.
24. Press top hem and insert crinoline.
25. Pin lining to drapery at bottom hem.
26. Fold in side edges of hem and sew.
27. Fold in top edge of lining, secure with T-pins and sew.
28. Measure and mark drapery for pleats.
29. Stitch the pleats at markings.
30. Determine type of pleat to be used.
31. Finish pleats by pinch, cartridge, and box methods.
32. Insert pleat pins (hooks) according to rod type and specifications in work order.
33. Fan-fold and band finished drapery.
34. Determine type and size of rod for rod pocket draperies.
35. Inspect the fabric and stitch the panels for rod pocket draperies.
36. Fold and press rod pocket to allow for size of rod and specified header.
37. Stitch rod pocket and header.
38. Determine length and style of tieback from work order.
39. Identify styles of tiebacks as listed: shaped, corded, ruffled, shirred, bands, and bow ties.
40. Construct each style of tieback.
41. Identify and apply trims to drapery as listed: ruffles, bands, and fringes.
42. Identify styles and types of top treatments as listed: valances, swags and cascades, and cornices.
43. Construct a valance.
44. Construct swags and cascades.
45. Construct a cornice.
46. Identify types of window specialties.
47. Construct a Roman shade.
48. Construct an Austrian shade.
49. Construct a balloon shade.
50. Identify types and styles of bedding.
51. Construct a fitted bedspread, lined and unlined.
52. Construct a throw-style bedspread, lined and unlined.
53. Construct a bed skirt.
54. Construct a fitted coverlet.
55. Construct a throw-style coverlet.
56. Construct pillow shams.
57. Construct decorative pillows.

UNIT III: Employment Preparation

Competencies:
1. Prepare a personal resume'.
2. Fill out a job application.
3. Prepare a letter of application.
4. Prepare a follow-up letter.

5. Participate in a mock job interview.
6. Describe procedure for resignation.
7. Write a letter of resignation.
8. Review potential job and educational opportunities.
9. Discuss Equal Opportunity Employment provisions and Affirmative Action Policies.
10. Promote public relations within the work place.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Home Economics **Course Title:** Culinary Occupations

CIP Code: 20.0403 **Course Length** 1350 Clock Hours - 12 Months

Course Description:

Culinary Occupations is an organized and specialized group of learning experiences which includes theory and supervised laboratory activities as they relate to planning, selecting, purchasing, preserving, preparing and serving quality food and food products. Students are prepared for employment in a variety of food service occupations. Emphasized are the study of foods, their nutritional content, standard measurements, cost control, menu planning, food preparation, quantity cooking, using and storing equipment, sanitation, serving techniques, and management.

Culinary Occupations is a competency-based course.

Units of Instruction:

I. Orientation to the Industry
II. Sanitation
III. Safety
IV. Teamwork
V. Nutrition
VI. Time and Stress Management
VII. Service
VIII. Theory of Production
IX. Tools and Utensils
X. Equipment
XI. Food Quality: Receiving, Storing, and Issuing
XII. Standard Recipe Use
XIII. Cold Production
XIV. Hot Production
XV. Baking and Pastries
XVI. Beverages
XVII. Employment Preparation

Curriculum Competency Outline

UNIT I: Orientation to the Industry

Competencies:

1. Identify and evaluate the demands of the industry.
2. Identify job availability.
3. Identify advancement possibilities and requirements.
4. Identify desirable worker traits.
5. Discuss economic impacts in the industry.

UNIT II: Sanitation

Competencies:

1. Identify hazards to safe food.
2. Demonstrate appropriate personal hygiene and sanitary work habits.

3. Identify Department of Health and Human Resources (DHHR) requirements and codes.
4. Use appropriate cleaning and sanitizing agents.

UNIT III: Safety

Competencies:
1. Identify kitchen and personal hazards.
2. Practice safe work habits and use preventive measures.
3. Demonstrate fire safety procedures and preventive measures.
4. Discuss emergency and disaster procedures.

UNIT IV: Teamwork

Competencies:
1. Discuss organizational structure.
2. Identify the chain of command.
3. Identify and use appropriate communications techniques.
4. Demonstrate individual responsibility to the team.

UNIT V: Nutrition

Competencies:
1. Identify the four basic food groups.
2. Identify the nutrients and their functions.
3. Evaluate menus for nutritional value.
4. Differentiate between regular and modified individual nutritional needs.
5. Discuss consequences of poor nutrition.

UNIT VI: Time and Stress Management

Competencies:
1. Identify the importance of self-control.
2. Exercise self-control.
3. Discuss advantages and benefits of good time management.
4. Plan your work and work your plan.
5. Identify ways to deal with stress.

UNIT VII: Service

Competencies:
1. Identify types of services and table settings for each.
2. Discuss dining room personnel and procedures.
3. Discuss guest/employee relationships and sales techniques.

UNIT VIII: Theory of Production

Competencies:
1. Identify production schedules.
2. Discuss importance of inventory procedures.
3. Use leftovers creatively.
4. Discuss organized work flow and potential problem areas.

UNIT IX: Tools and Utensils

Competencies:
1. Differentiate between tools and utensils.
2. Identify and use the correct tool and utensil for the specific job.
3. Demonstrate appropriate care and storage.

UNIT X: Equipment

Competencies:
1. Differentiate between kinds of equipment.
2. Identify and use the correct equipment for the specific job.
3. Demonstrate appropriate care and storage.
4. Assemble and disassemble major pieces of equipment.

5. Perform preventive maintenance.
6. Discuss safety procedures unique to each piece of equipment.

UNIT XI: Food Quality: Receiving, Storing, and Issuing

Competencies:

1. Identify criteria for receiving good quality food products.
2. Demonstrate use of scales.
3. Identify food service terminology.
4. Reconcile order to shipment invoice.
5. Identify and practice category storage.
6. Identify and practice First In, First Out (FIFO) storage method.
7. Monitor storage temperatures.
8. Discuss safety and security in storage.
9. Perform perpetual and physical inventory of food supplies.
10. Describe appropriate requisition procedures.

UNIT XII: Standard Recipe Use

Competencies:

1. Define terms related to standard recipes.
2. Demonstrate appropriate weighing and measuring procedures.
3. Perform basic culinary techniques precisely.
4. Explain components of a standard recipe.
5. Use standard recipes for food preparation.
6. Perform recipe conversion.

UNIT XIII: Cold Production

Competencies:

1. Identify food items generally served cold.
2. Describe and perform procedures for handling, preparing, and holding of vegetables and fruits.
3. Describe and perform procedures for handling, preparing, and holding of meat, poultry, and seafood.
4. Describe and perform procedures for handling, preparing, and holding dairy products and eggs.
5. Describe and perform procedures for handling, preparing, and holding of dressings.
6. Describe and perform sandwich preparation.
7. Describe and perform procedures for handling, preparing, and holding of garnishes.
8. Describe and perform procedures for handling, preparing, and holding of hors d'oeuvres.
9. Demonstrate creative salad assembly.

UNIT XIV: Hot Production

Competencies:

1. Identify food items generally served hot.
2. Describe and perform procedures for handling, preparing and holding of vegetables and fruits.
3. Describe and perform procedures for handling, preparing, and holding of meat, poultry, and seafood.
4. Identify basic cuts of beef, veal, pork, and lamb.
5. Cut up a chicken.
6. Identify basic culinary techniques for cooking meats, poultry, and seafood.
7. Prepare basic stocks.
8. Prepare five basic sauces.
9. Prepare basic soups.
10. Describe and perform hot sandwich preparation.
11. Use creative garnishes for enchancing hot foods.

12. Describe and perform procedures for handling, preparing, and holding hors d'ouevres.
13. Prepare starches.
14. Prepare breakfast menu items.

UNIT XV: Baking and Pastries

Competencies:
1. Identify basic baking ingredients.
2. Identify bakery tools, utensils, and equipment.
3. Demonstrate the use of baking formula.
4. Prepare various cookies.
5. Prepare yeast breads and rolls.
6. Prepare sweet yeast dough products.
7. Prepare quick breads.
8. Prepare cakes and icings.
9. Perform basic cake decorating techniques.
10. Prepare pastries and pies.

UNIT XVI: Beverages

Competencies:
1. Prepare coffee.
2. Prepare tea.
3. Prepare a foundation punch.

UNIT XVII: Employment Preparation

Competencies:
1. Prepare a personal resume'.
2. Complete a job application.
3. Describe procedure for resignation.
4. Write a letter of resignation.
5. Participate in a mock interview.
6. Discuss Equal Opportunity Employment provisions and Affirmative Action policies in the work place.
7. Promote public relations within the work place.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Home Economics

Course Title: Dietary Manager

CIP Code: 20.0404

Course Length 1350 Clock Hours - 12 Months

Course Description:

This course prepares students for employment as supportive dietetic personnel who provide nutritional care services and food service management in health facilities under the supervision of a dietitian, or an administrator and a counsulting dietitian.

Competency-based classroom instruction includes sanitation and safety, use of equipment, nutrition, organization and management, food production, cost control, staff development, and diet therapy. Clinical experience is obtained in a health care facility under the supervision of the instructor and dietitian.

Units of Instruction:

I. Orientation to the Industry
II. Sanitation and Safety
III. Equipment
IV. Nutrition
V. Organization and Management
VI. Meal Management
VII. Purchasing, Receiving, and Storage
VIII. Food Production
IX. Cost Control
X. Diet Therapy
XI. Staff Development
XII. Employment Preparation

Curriculum Competency Outline

UNIT I: Orientation to the Industry

Competencies:

1. Identify the qualifications and responsibilities of dietary managers and other food service personnel.
2. Compare the types of food service operations and give the advantages and disadvantages of each.
3. Identify professional food service organizations citing benefits of membership.

UNIT II: Sanitation and Safety

Competencies:

1. Identify hazards to safe food.
2. Identify sanitary procedures for safe food preparation and service.
3. Identify personnel safety hazards possible in a commercial or institutional kitchen.
4. Identify and practice safe work habits.

UNIT III: Equipment

Competencies:
1. Identify large and small equipment.
2. Demonstrate appropriate use and care of large and small equipment.
3. Analyze equipment needs for specific institutions.
4. Write equipment specifications.

UNIT IV: Nutrition

Competencies:
1. Identify nutrients and give functions and sources of each.
2. Identify the importance of proper nutrition to good health.
3. Identify and explain the basic four food groups.
4. Recognize and compare nutritional requirements for different age groups.
5. Plan nutritionally adequate diets for various age groups.
6. Trace the route of digestion and absorption of nutrients in the gastrointestinal tract.

UNIT V: Organization and Management

Competencies:
1. List and define functions and tools of management.
2. Discuss theories of management.
3. Identify records to be kept when operating a food service facility.
4. Discuss decision-making and problem-solving techniques.
5. Discuss labor policies and legislation.

UNIT VI: Meal Management

Competencies:
1. Define factors to be considered when planning good menus.
2. Plan and evaluate cycle menus.
3. Discuss styles of service and correct table service.

UNIT VII: Purchasing, Receiving, and Storage

Competencies:
1. Define factors to be considered when purchasing foods.
2. Summarize the principles of ordering and receiving food and supplies.
3. Perform procedures for receiving and storing food and supplies.
4. Maintain perpetual and physical inventory.

UNIT VIII: Food Production

Competencies:
1. Demonstrate basic food preparation methods and procedures.
2. Demonstrate basic weighing and measuring procedures.
3. Define commonly used baking and cooking terms.
4. Standardize recipes.
5. Prepare production schedules.
6. Identify and discuss methods of work simplification and motion economy.

UNIT IX: Cost Control

Competencies:
1. Recognize factors that could lead to increases and decreases in food, labor, and operating costs.
2. Complete commonly used records.
3. Cost and price menu items.
4. Plan and implement a budget.

UNIT X: Diet Therapy

Competencies:
1. Apply principles of diet therapy in the treatment of disease.
2. Nutritionally assess the needs of an individual based on personal data, laboratory data and dietary analysis.
3. Formulate a dietary plan.
4. Outline pertinent data to be included in charting.

UNIT XI: Staff Development

Competencies:

1. Formulate a plan to recruit, hire, train, and evaluate employees.
2. Explain principles of good communications and human relations.
3. Identify motivational techniques.
4. Demonstrate counseling and disciplinary strategies.
5. Conduct appropriate inservice activities.

UNIT XII: Employment Preparation

Competencies:

1. Explain the procedure for obtaining and maintaining certification.
2. Describe the role of the dietary manager relating to legal responsibilities.
3. Prepare a personal resume'.
4. Complete a job application.
5. Describe procedure for resignation.
6. Write a letter of resignation.
7. Participate in a mock interview.
8. Discuss Equal Opportunity Employment provisions and Affirmative Action policies in the work place.
9. Promote public relations within the work place.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education
Competency-Based Course Outline

Program Area: Home Economics

Course Title: Homemaker's Aide

CIP Code: 20.0606

Course Length 675 Clock Hours - 6 Months

Course Description:

This course prepares students for employment in homes of the elderly and/or disabled who require the assistance of skilled workers who have been trained in home management and limited personal care procedures. Some of the services that may be provided are housecleaning, preparing meals, washing and drying clothes, and assistance with grooming.

Topics included in the classroom instruction and laboratory experiences are interpersonal and communication skills, basic cleaning and laundering procedures, food preparation and serving, basic mending and patching, and personal hygiene and special needs.

Units of Instruction:

I. Orientation to the Industry
II. Interpersonal Skills
III. Communication Skills
IV. Providing Assistance With Personal Hygiene and Special Needs
V. Basic Cleaning and Laundering Procedures
VI. Food Preparation and Serving
VII. Basic Mending and Patching
VIII. Employment Preparation

Curriculum Competency Outline

UNIT I: Orientation to the Industry

Competencies:

1. Discuss the job markets, salaries and working conditions.
2. Discuss job responsibilities.
3. Discuss ethical considerations.
4. Discuss legal considerations.
5. Assess and maintain safe environment.
6. Perform Cardiopulmonary Resuscitation (CPR) and First Aid Procedures.

UNIT II: Interpersonal Skills

Competencies:

1. Identify and practice appropriate personal hygiene measures such as cleanliness and good grooming.
2. Identify and practice appropriate personal attributes such as dependability and honesty.
3. Establish, maintain, and terminate professional relationships in appropriate manner.
4. Be a good listener.
5. Refrain from judgmental attitudes.

UNIT III: Communication Skills

Competencies:
1. Practice basic courtesies such as meeting and greeting.
2. Practice effective telephone communication skills.
3. Perform basic emergency communications such as notifying Emergency Medical Services (EMS), ambulance services, police and fire departments.
4. Practice observation and documentation skills.
5. Assist client with written communication skills as needed.

UNIT IV: Providing Assistance With Personal Hygiene and Special Needs

Competencies:
1. Identify available community resources in order to meet client's special needs.
2. Assist client with grooming.
3. Encourage the individual to be as independent as possible within his/her limitations.
4. Respect parent's wishes in regard to child care.
5. Respect client's wishes/dignity in regard to care.

UNIT V: Basic Cleaning and Laundering Procedures

Competencies:
1. Identify safety practices for cleaning and laundering.
2. Determine activities and sequency plan for housekeeping.
3. Adapt plan as far as possible to client needs and requests.
4. Identify, use, and care for tools and equipment.
5. Select wisely from available equipment.
6. Identify cleaning agents, their appropriate use, and storage.
7. Identify the different types of floors and walls and cleaning procedures for each.
8. Perform cleaning procedures for living areas, bedrooms, kitchens, and bathrooms.
9. Determine activities and sequency plan for laundering.
10. Identify laundering agents, their appropriate use, and storage.
11. Demonstrate appropriate home laundering methods by machine and hand.
12. Identify and perform appropriate drying techniques.
13. Perform appropriate ironing, folding, and storing procedures.

UNIT VI: Food Preparation and Serving

Competencies:
1. Identify the Basic Four Food Groups and choose foods accordingly.
2. Perform elementary procedures of food preparation for meat, fish, poultry, eggs, vegetables, salads, fruits, desserts, quick breads, and beverages.
3. Plan and prepare nutritious meals within a time and budget framework.
4. Encourage client to follow physician's diet instructions.
5. Discuss appropriate sanitation and storage of foods.
6. Demonstrate appropriate basic table setting and food serving.
7. Perform appropriate dishwashing and clean-up procedures.

UNIT VII: Basic Mending and Patching

Competencies:
1. Perform basic hand sewing.
2. Replace fasteners such as buttons, snaps, hooks and eyes.
3. Repair garments using basic hand sewing techniques.

UNIT VIII: Employment Preparation

Competencies:
1. Prepare a personal resume'.
2. Fill out a job application.
3. Prepare a letter of application.
4. Prepare a follow-up letter.
5. Dress appropriately for a job interview.

BEST COPY AVAILABLE

6. Participate in a mock job interview.
7. Describe procedure for resignation.
8. Write a letter of resignation.
9. Review potential job and continuing education opportunities.
10. Research potential employers.
11. Discuss obligations expected from you as an employee as well as from your potential employer.
12. Discuss Equal Opportunities Policies.
13. Discuss Affirmative Action Practices.
14. Discuss positive responses to interviewer's questions.
15. Discuss public relations in the work place.

TRADE AND INDUSTRIAL

Air Conditioning/Refrigeration
Appliance Repair
Auto Body Repair
Automotive Technician
Aviation Maintenance Technology
Band and Circular Saw Filing
Carpentry
Commercial Art
Communications Electronics
Computer Electronics
Consumer Electronics Technician
Diesel Mechanics
Electrician
Graphic Arts
Heavy Equipment Mechanic
Heavy Equipment Operator
Industrial Electronics
Industrial Machine Shop
Industrial Maintenance Technician
Instrumentation
Jewelry Technology
Marine Operations
Masonry
Meat Processing
Office Equipment Repair
Outdoor Power Equipment Technician
Pipefitting
Plumbing
Power Line Technician
Truck Driving
Upholstering
Welding

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Trade and Industrial **Course Title:** Air Conditioning/Refrigeration

CIP Code: 47.0201 **Course Length** 2700 Clock Hours - 24 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical shop experience to prepare students for employment in a variety of jobs in the field of air conditioning and refrigeration or to provide supplemental training for persons previously or currently employed in air conditioning and refrigeration.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The content is organized into competency-based units of instruction which specify occupational competencies which the student must successfully complete.

The Air Conditioning/Refrigeration course generally prepares individuals to install, diagnose, repair, and maintain the operating condition of domestic and commercial heating, air conditioning, and refrigeration systems.

Units of Instruction:

I. Introduction to Air Conditioning/Refrigeration
II. Related Math and Science
III. Human Relations
IV. Tools and Materials
V. Theory of Refrigeration and Component Parts
VI. Electricity
VII. Domestic Refrigeration
VIII. Room Air Conditioning
IX. Central Air Conditioning Systems
X. Forced Air Heating in Central Units
XI. Heat Pumps
XII. Commercial Air Conditioning and Heating
XIII. Commercial Refrigeration
XIV. Business Practices
XV. Job Seeking Skills

Curriculum Competency Outline

UNIT I: Introduction to Air Conditioning/Refrigeration

Competencies:

1. Identify terms associated with the air conditioning and refrigeration occupations.
2. Demonstrate a knowledge of job requirements.
3. Demonstrate a knowledge of the working conditions of an air conditioning and refrigeration technician.
4. Demonstrate a knowledge of career opportunities.
5. Demonstrate a knowledge of codes, standards, and regulations.
6. Identify the safety hazards associated with the air conditioning and refrigeration occupations.

UNIT II: Related Math and Science

Competencies:

1. Identify terms associated with basic mathematics.
2. Perform basic mathematical computations in addition, subtraction, multiplication, and division of whole numbers.
3. Perform basic mathematical computations in addition, subtraction, multiplication, and division of fractions, decimals, and mixed numbers.
4. Determine areas.
5. Determine volumes.
6. Determine pressures.
7. Determine lengths.
8. Determine weights.
9. Determine velocities.
10. Identify United States Standard Units of Measurement.
11. Identify International/Metric Standard Units of Measurement.
12. Identify states of matter.
13. Identify physical laws affecting gases.
14. Identify physical laws affecting conduction/heat transfer.
15. Interpret temperature-pressure relationship.
16. Differentiate between specific heat, latent heat, and sensible heat.
17. Differentiate between atmospheric pressure and absolute pressure.
18. Differentiate between Boyle's Law and Charles' Law.
19. Solve problems using Boyle's Law and Charles' Law.
20. Identify changes in state of a substance.
21. Identify the units of measurement used in air conditioning and refrigeration.
22. Identify the units of measurement used in heating.

UNIT III: Human Relations

Competencies:

1. Identify terms associated with human relations.
2. Demonstrate a willingness to learn.
3. Demonstrate a professional attitude.
4. Demonstrate the ability to be a good listener.
5. Demonstrate the ability to follow oral and written instructions.
6. Demonstrate the ability to communicate instructions accurately and effectively.
7. Demonstrate high reliability in the performance of service procedures.
8. Demonstrate problem-solving skills.
9. Demonstrate punctuality.
10. Exhibit pride and loyalty.
11. Comply with safety and health rules.
12. Demonstrate personal hygiene and cleanliness.
13. Show empathy, respect, and support for others.
14. Write legibly.

UNIT IV: Tools and Materials

Competencies:

1. Identify terms associated with tools and materials.
2. Identify various types of hand tools.
3. Demonstrate proper use, safety, and care of hand tools.
4. Identify various types of power tools—portable and stationary.
5. Demonstrate proper use, safety, and care of power tools—portable and stationary.
6. Identify various types of test equipment—electrical and mechanical.
7. Demonstrate proper use, safety, and care of test equipment—electrical and mechanical.
8. Identify the components of oxyfuel cutting and welding equipment.

9. Demonstrate the proper setup, use, safety, and care in working with oxyfuel cutting and welding equipment.
10. Identify types of soldering equipment.
11. Identify various types of measuring instruments/devices.
12. Identify tubing by name, size, and application.
13. Demonstrate the ability to select, cut, bend, flare, and swage tubing (copper, aluminum and steel).
14. Identify brass and copper pipe fittings by name, type, and size.
15. Identify Acrylonitrile Butadiene Styrene (ABS), Polyethylene (PE), Polyvinyl Chloride (PVC), Chlorinated Polyvinyl Chloride (CPVC), Stainless Steel, Steel, Wrought Iron, Black Iron, Air Conditioning and Refrigeration Tubing (ACR) piping by name, type, and size.
16. Identify pipe fittings by name, type, and size.
17. Demonstrate the ability to weld and cut steel using oxyfuel.
18. Demonstrate the ability to soft-solder, braze, and silver-braze joints and connections.
19. Demonstrate the ability to cut and thread pipe using hand and power tools.
20. Identify various types of metal fasteners.
21. Select and install metal fasteners.
22. Demonstrate the proper selection, use, safety, and care of measuring instruments/devices.
23. Identify various types of refrigerants.
24. Identify color codes used on refrigerant cylinders.
25. Identify type of refrigerant being used in a designated refrigeration/cooling unit.
26. Identify various types of lubricants.
27. Select and use correct lubricants.
28. Identify various types of sealants.
29. Apply various types of sealants.
30. Identify various types of insulation materials.
31. Apply insulation materials.
32. Identify various types of desiccants.
33. Demonstrate the proper selection, use, and installation of desiccant charges in system.
34. Identify various types of leak detectors.
35. Demonstrate the ability to select and use a leak detector to service a system.
36. Identify various types of electric wiring and connectors.
37. Demonstrate the ability to select and install electric wiring and connectors.
38. Identify various types of fire extinguishers.
39. Demonstrate the ability to select and use various types of fire extinguishers.
40. Identify various types of personal safety equipment.
41. Use personal safety equipment in the performance of job scope operations.

UNIT V: Theory of Refrigeration and Component Parts

Competencies:

1. Identify terms associated with refrigeration/cooling systems.
2. Demonstrate a knowledge of the basic laws of heat and cooling.
3. Explain the basic principles of refrigeration.
4. Identify refrigeration system components.
5. Demonstrate knowledge of refrigerants and pressure temperature relationship.
6. Demonstrate knowledge of compressors: construction/operation.
7. Demonstrate knowledge of evaporators: construction/operation.
8. Demonstrate knowledge of condensers: construction/operation.
9. Demonstrate knowledge of metering devices: construction/operation.
10. Apply factors concerning latent and sensible heat to the operation of a refrigeration system.
11. Demonstrate knowledge of accessory components of a refrigeration system: construction/operation.

12. Identify and locate ports to mount gauges for test/service purposes.
13. Locate and interpret component data plates.
14. Describe the basic techniques used to evacuate a refrigeration/cooling system.
15. Describe the basic techniques used to clean a refrigeration/cooling system.
16. Describe the basic techniques used to dehydrate a refrigeration/cooling system.
17. Describe the basic techniques used to charge a refrigeration/cooling system with refrigerant.
18. Demonstrate the ability to evacuate, clean, and dehydrate/charge refrigeration and cooling systems.
19. Identify and describe the characteristics of psychrometric charts.
20. Utilize psychrometric charts to determine the properties of air to be conditioned.
21. Measure and record wet and dry bulb temperatures.
22. Determine relative humidity of entering/leaving air.
23. Evaluate refrigerant pipe sizing.
24. Identify safety hazards.
25. Apply safety practices.

UNIT VI: Electricity

Competencies;

1. Identify terms associated with basic electricity.
2. Define Ohm's Law.
3. Use Ohm's Law to solve problems in series, parallel, and combination circuits.
4. Define Kirchhoff's Law.
5. Use Kirchhoff's Law to solve problems in series, parallel, and combination circuits.
6. Define magnetism.
7. Describe the relationship of magnetism to electrical circuitry.
8. Identify sources and types of electricity.
9. Identify electrical measuring instruments.
10. Perform voltage, current, and resistance measurements.
11. Demonstrate a knowledge of direct current (dc) theory.
12. Demonstrate a knowledge of alternating current (ac) theory.
13. Demonstrate a knowledge of transformer principles.
14. Describe the progression of electrical development and application.
15. Demonstrate a knowledge of semiconductor devices and their application.
16. Identify electrical symbols.
17. Identify various types of electrical/electronic components found in the air conditioning and refrigeration industry.
18. Describe the operation of various types of electrical/electronic components used in the air conditioning and refrigeration industry.
19. Demonstrate proper use of electrical/electronic test meters in diagnosis of circuits or components.
20. Perform electrical continuity test, voltage check, and current test with appropriate meter.
21. Apply basic electrical theory and calculations.
22. Identify various types of solid-state protective devices.
23. Identify various types of capacitors.
24. Identify various types of starters.
25. Identify alternating current (ac) and direct current (dc) electric motors by type, size, rating, and application.
26. Demonstrate knowledge of electric motor parts and operating principles.
27. Demonstrate knowledge of operational use, servicing, and repair of electric motors.
28. Determine electric motor speed and direction of rotation.
29. Identify terminals and inspect electric motors for opens, shorts, and other possible defects.
30. Change voltage on dual voltage electric motors.
31. Reverse rotation of various types of electric motors.

32. Service or make minor repairs on starters—manual and automatic.
33. Read and interpret information on electric motor data plate.
34. Demonstrate a knowledge of the operation and function of capacitors, solenoids, relays, switches, thermostats, and contactor devices.
35. Test capacitors—start and run.
36. Test solenoids.
37. Test fuses.
38. Test solid-state protective devices.
39. Test semiconductor devices.
40. Identify terms associated with the National Electrical Code (NEC).
41. Demonstrate a knowledge of the National Electrical Code.
42. Identify National Electrical Code applications.
43. Test single- and three-phase electric motors.
44. Read and interpret electrical diagrams/schematics.
45. Read and interpret architectural, electrical, and mechanical blueprints.
46. Identify 115-120 volt single-phase, 200-240 volt single-phase, 227 volt single-phase, 220-240 volt three-phase, 440-480 volt three-phase sources and types of electric current.
47. Demonstrate the ability to identify, select, and measure wire sizes.
48. Identify safety hazards associated with electricity.
49. Apply safety practices.

UNIT VII: Domestic Refrigeration

Competencies:

1. Identify terms associated with domestic refrigeration.
2. Identify various types of domestic refrigerators/freezers.
3. Identify the component parts of domestic refrigerators/freezers.
4. Identify accessory components of domestic refrigerators/freezers (ice makers, beverage dispensers, etc.).
5. Identify control devices found on domestic refrigerators/freezers.
6. Read and interpret data plates.
7. Construct ladder diagrams.
8. Identify and locate control devices.
9. Describe the operation and function of control devices.
10. Demonstrate a knowledge of thermostat to temperature controls at a given temperature reference.
11. Install and check operation of a domestic unit.
12. Evaluate the installation of a domestic unit.
13. Apply troubleshooting techniques for refrigeration systems.
14. Read and interpret refrigeration equipment electrical diagrams.
15. Identify, select, and properly use instruments/gauges (electrical, electronic, temperature, vacuum, etc.).
16. Perform electrical continuity test, voltage check, and current check with appropriate meter.
17. Evacuate a domestic unit.
18. Charge a sealed-type domestic system with proper refrigerant.
19. Perform tests, locate, and repair refrigerant leaks.
20. Perform tests and replace hermetic compressor.
21. Perform tests and repair/replace capillary-tube refrigerant controls.
22. Repair/replace bimetal temperature controls.
23. Perform minor motor repairs.
24. Perform tests, remove, and install drier.

25. Perform tests and make diagnosis of electrical system.
26. Perform tests and adjust/replace unit control devices.
27. Perform tests and replace hot-wire relay.
28. Perform tests and replace starting current relay.
29. Perform tests and repair/replace defrost—hot-gas/electric.
30. Check , test, and repair/replace automatic ice maker.
31. Inspect, remove, and replace/install door seals.
32. Inspect, remove, and replace/install breaker trim.
33. Check and adjust cabinet door.
34. Check and replace/install door hardware.
35. Perform tests and remove/replace electric motors.
36. Perform tests and remove/replace thermostats.
37. Perform tests and remove/replace defrost terminators.
38. Troubleshoot/repair condenser problems.
39. Troubleshoot/repair evaporator problems.
40. Read and interpret parts/service manuals.
41. Identify safety hazards associated with domestic refrigeration.
42. Apply safety practices.

UNIT VIII: Room Air Conditioning

Competencies:

1. Identify terms associated with room air conditioning.
2. Demonstrate a knowledge of the factors essential to air conditioning—temperature control, humidity control, air movement, air infiltration, and air filtering.
3. Identify and describe the operation and function of room air conditioning components.
4. Locate and identify unit controls.
5. Measure and record wet and dry bulb temperatures.
6. Determine relative humidity of entering/leaving air.
7. Calculate heat loads of room(s).
8. Demonstrate the ability to size a unit for room air conditioning.
9. Demonstrate operating principles of air conditioning system unit.
10. Troubleshoot, remove, repair, and replace/install condensers.
11. Troubleshoot, remove, repair, and replace/install evaporator.
12. Troubleshoot, remove, repair, and replace/install compressor unit.
13. Troubleshoot, remove, repair, and replace/install metering devices.
14. Troubleshoot, remove, and install thermostatic controls.
15. Perform service techniques for replacing "burned-out" compressors.
16. Troubleshoot and repair/replace electrical system components.
17. Install/replace piping.
18. Troubleshoot, remove, repair, and replace/install fan motors.
19. Troubleshoot condensate drain problems.
20. Identify, select, and install air filtering devices.
21. Evacuate a room air conditioning system.
22. Dehydrate a room air conditioning system.
23. Identify and select proper refrigerant.
24. Identify, select, and install proper filter-drier for a unit.
25. Clean a room air conditioning unit.
26. Charge a room air conditioning unit with proper refrigerant.
27. Perform preventive/seasonal maintenance on room air conditioning unit.
28. Demonstrate a knowledge of local, state, and National Electrical Code (NEC) requirements for room air conditioning installations.
29. Determine wire/conductor size(s) required for the installation of a room air conditioning unit.
30. Demonstrate the ability to install a window air conditioning unit to meet manufacturer's specifications.

31. Interpret electrical diagrams/schematics.
32. Locate and repair refrigerant system leaks.
33. Identify safety hazards associated with room air conditioning.
34. Apply safety practices.

UNIT IX: Central Air Conditioning Systems

Competencies:

1. Identify terms associated with central air conditioning systems.
2. Identify the factors that affect central air conditioning efficiency.
3. Identify the various types and characteristics of central air conditioning systems.
4. Identify and describe the function and operation of central air conditioning system components.
5. Identify factors that determine ductwork sizing.
6. Identify various types of air filtering devices.
7. Describe the operation of various air filtering devices.
8. Identify various types of humidifiers/dehumidifiers and describe their operation and function.
9. Determine heat loss/heat gain (k-factor).
10. Obtain data required for sizing a central air conditioning unit for a given/designated structure.
11. Determine wire/conductor size needed for a given installation.
12. Demonstrate the ability to install a designated central air conditioning system.
13. Identify various types of electrical components found on central air conditioning systems.
14. Identify various types of control devices found on central air conditioning systems.
15. Identify factors associated with circulation/ventilation and air balance in central air conditioning systems.
16. Identify various types of compressors and describe their characteristics.
17. Identify various types of evaporators and describe their characteristics.
18. Identify various types of condensers and describe their characteristics.
19. Identify various types of metering devices and describe their characteristics.
20. Identify various types of temperature regulating devices used with central air conditioning systems.
21. Identify various types of solid-state control devices and protective devices used with central air conditioning systems.
22. Identify the types of refrigerants used in central air conditioning systems.
23. Identify the various types of lubricants used in central air conditioning systems.
24. Identify the various types of tubing/piping used with central air conditioning systems.
25. Calculate heating and cooling requirements.
26. Calculate air distribution systems.
27. Determine air properties by use of psychrometrics.
28. Calculate heating and cooling equipment sizes.
29. Troubleshoot and perform repair/installation of blower motors to industry specifications.
30. Troubleshoot and perform repair/installation of central air conditioning compressors to manufacturer's specifications.
31. Troubleshoot and perform repair/installation of central air conditioning evaporators to manufacturer's specifications.
32. Troubleshoot and perform repair/installation of central air conditioning condensers to manufacturer's specification.
33. Troubleshoot and perform repair/installation of central air conditioning metering devices to manufacturer's specifications.
34. Troubleshoot and perform repair/installation of central air conditioning temperature control devices.
35. Troubleshoot and perform repair/installation of air filtering devices.

36. Troubleshoot and perform repair/installation of electrical/electronic devices.
37. Evacuate a central air conditioning system.
38. Clean a system diagnosed as having compressor burn-out indications.
39. Dehydrate a system.
40. Replace filter-driers.
41. Purge a central air conditioning system.
42. Select refrigerant and charge a central air conditioning system.
43. Test, locate, and repair refrigerant leaks.
44. Perform preventive/seasonal maintenance.
45. Troubleshoot condensate removal problems.
46. Identify factors affecting placement and routing of intake/discharge refrigerant lines.
47. Install tubing/piping insulation.
48. Troubleshoot humidifier/dehumidifier problems.
49. Adjust/install drive belts.
50. Lubricate humidifiers/dehumidifiers to manufacturer's specifications.
51. Clean humidifiers/dehumidifiers.
52. Locate and repair dehumidifier refrigerant leaks.
53. Recharge dehumidifier with appropriate refrigerant.
54. Performance-test central air conditioning systems, humidifiers/dehumidifiers, and filtering equipment.
55. Calculate infiltration for heat loads.
56. Read and interpret electrical diagrams/schematics.
57. Construct ladder diagrams.
58. Identify safety hazards associated with central air conditioning systems.
59. Apply safety practices.

UNIT X: Forced Air Heating in Central Units

Competencies:

1. Identify terms associated with forced air heating in central units.
2. Identify various types of forced air central heating units.
3. Describe the characteristics, operation, and function of various types of forced air central heating units.
4. Identify the heating components of various types of forced air heating systems.
5. Identify various types of gas controls and related gas devices on forced air central heating units.
6. Identify various types of solid-state devices associated with forced air central heating units.
7. Identify various types of safety devices associated with forced air central heating units.
8. Identify various types of temperature control devices associated with forced air central heating units.
9. Identify various types of electrical components associated with forced air central heating units.
10. Identify related accessory components associated with forced air central heating systems.
11. Perform test and repair/replace electrical heating elements.
12. Perform test and repair/replace electrical control devices.
13. Perform test and repair/replace fan/blower motors.
14. Perform test and repair/replace sequencers.
15. Perform test and repair/replace temperature control devices.
16. Perform test and repair/replace bearing assemblies.
17. Adjust/replace fan belts.
18. Clean/replace filters.
19. Perform test and replace defective solid-state devices.
20. Perform test and repair/replace fuse links.
21. Remove, clean, and reinstall the burner on a gas heater.
22. Perform test and repair/replace fan limit switch on gas heater.
23. Perform test and repair/replace thermocouple on gas heater.

24. Perform test and repair/replace gas valve on gas heater.
25. Perform test and repair/replace automatic ignition/pilot devices.
26. Perform test and repair/replace temperature control devices.
27. Adjust the gas-air mixture on burner.
28. Install an electronic ignition on gas heater.
29. Identify the characteristics of a cracked heat exchanger.
30. Perform test and repair/replace gas heater safety devices.
31. Light pilot lights.
32. Install piping/tubing to heating units.
33. Determine heat loss (U-Factor).
34. Identify the factors to be considered in designing a forced air central heating system.
35. Clean heating units.
36. Differentiate between pulse heaters and condensing furnaces.
37. Identify the characteristics of fuel-oil heaters.
38. Identify local, state, and national codes.
39. Design a forced air central heating system for a designated building.
40. Select forced air central heating unit size to meet design requirements.
41. Design a duct system (supply/return air).
42. Identify factors to be considered in the selection of auxiliary strip heaters and duct heaters.
43. Identify the factors to be considered in the selection of humidifiers.
44. Identify the factors to be considered in the selection of electrostatic filters.
45. Install an electric heat forced air central heating system.
46. Install a gas heat forced air central heating system.
47. Install humidifiers.
48. Install electrostatic air filtering systems.
49. Apply local, state, and national codes.
50. Perform preventive maintenance.
51. Read and interpret electrical diagrams/schematics.
52. Read and interpret manufacturer's specifications.
53. Test and analyze heating air movement systems.
54. Perform preventive/seasonal maintenance.
55. Identify safety hazards associated with forced air central heating systems.
56. Apply safety practices.

UNIT XI: Heat Pumps

Competencies:

1. Identify terms associated with heat pumps.
2. Identify and describe the basic types of heat pumps and explain their operation
3. Identify the advantages of heat pump and electric heater systems.
4. Identify the components of various types of heat pump systems.
5. Identify the control/metering devices found on various types of heat pump systems
6. Identify the temperature control devices used with heat pump systems.
7. Differentiate between a reverse cycle air conditioning unit and a standard air conditioning unit.
8. Describe the principles and operation of a water/earth source heat pump system
9. Identify the operating mode of a heat pump.
10. Perform test and repair/replace four-way valves.
11. Perform test and repair/replace check valves.
12. Perform test and repair/replace temperature control devices.
13. Perform test and repair/replace evaporators.
14. Perform test and repair/replace condensers.
15. Perform test and repair/replace fan/blower motors.
16. Perform test and repair/replace compressors.
17. Repair/replace tubing/piping and fittings.
18. Perform test and repair/replace electrical components.
19. Perform test and replace defective solid-state devices.

20. Perform test and repair/replace defrost control devices used on heat pumps.
21. Evacuate a heat pump system per manufacturer's specifications.
22. Clean a heat pump system after compressor burn-out indications.
23. Purge and dehydrate a heat pump system.
24. Select refrigerant and charge a heat pump system per manufacturer's specifications.
25. Obtain information from data plates.
26. Test and locate leaks using halide torch electronic test devices and using foam applications.
27. Replace filter-driers.
28. Perform test and repair/replace metering devices.
29. Remove restrictions in refrigerant lines/metering devices.
30. Install control wiring on the heat pump.
31. Identify and locate hot water take-offs.
32. Perform test and repair/replace indoor/outdoor thermostats.
33. Perform test and repair/replace indoor/outdoor electric motors.
34. Perform test and replace solid-state control devices.
35. Check indoor and outdoor coils for air restrictions.
36. Clean/replace air filters.
37. Determine heat gain and heat loss.
38. Calculate load, design, and lay out heat pump heating and cooling system
39. Test and analyze air movement systems.
40. Design duct systems (air supply/return) and identify related components.
41. Determine supplemental heat requirements.
42. Determine wire sizes required for the installation of a heat pump system.
43. Demonstrate the ability to install heat pump as a new or "add-on" application per manufacturer's specifications.
44. Apply local, state and national codes.
45. Read and interpret electrical diagrams schematics.
46. Read and interpret flow charts.
47. Identify safety hazards associated with heat pumps.
48. Apply safety practices.

UNIT XII: Commercial Air Conditioning and Heating

Competencies:

1. Identify terms associated with commercial air conditioning and heating
2. Identify the various types of commercial air conditioning and heating systems.
3. Describe the basic operation and applications of the various types of commercial air conditioning and heating systems.
4. Identify the basic component of various types of commercial air conditioning and heating systems.
5. Describe the operation and function of chilled-water air handling units.
6. Describe the applications, operation, and function of flow-setters.
7. Describe the applications, operation, and function of pre-heaters.
8. Describe the applications, operation, and function of economizers.
9. Describe the applications, operation, and function of humidifiers.
10. Describe the applications, operation, and function of duct heaters.
11. Describe the applications, operation, and function of high and low pressure return systems.
12. Describe the applications, operation, and function of variable air volume (VAVs) registers.
13. Describe the applications, operation, and function of pneumatic thermostats.
14. Describe the applications, operation, and function of pneumatic compressors.
15. Describe the applications, operation, and function of pneumatic driers.
16. Describe the applications, operation, and function of static pressure controls.
17. Describe the applications, operation, and function of water towers.

18. Identify the factors that determine sheave sizing.
19. Identify the factors that determine belt types and sizing.
20. Identify safety factors associated with power plant operations.
21. Identify the factors that determine filter types and applications.
22. Describe the applications, operation, and function of chilled-water system pumps and piping.
23. Determine the factors that affect air balance.
24. Determine the factors that affect water balance.
25. Identify various types of boilers (hot water/steam).
26. Identify the components of hot water/steam boilers.
27. Identify the controls/safety devices of hot water/steam boilers.
28. Identify safety requirements for hot water/steam boiler applications.
29. Identify factors that affect and determine water treatment.
30. Describe the application, operation, and function of modulating water control valves.
31. Identify various types of chemicals used in commercial air conditioning and heating applications for water treatment.
32. Read and interpret electrical diagrams/schematics.
33. Read and interpret building mechanical blueprints/drawings and specification sheets.
34. Read and interpret parts/service manuals.
35. Troubleshoot commercial air conditioning and heating systems.
36. Perform preventive maintenance.
37. Identify safety hazards associated with commercial air conditioning and heating.
38. Apply safety practices.

UNIT XIII: Commercial Refrigeration

Competencies:

1. Identify terms associated with commercial refrigeration.
2. Identify various types of commercial refrigeration units.
3. Identify the applications of various types of commercial refrigeration units.
4. Identify the basic components of commercial refrigeration systems.
5. Identify and describe the operation of various types of metering devices found on commercial refrigeration units.
6. Identify the factors affecting commercial refrigeration piping and compressor installations.
7. Perform test and repair/replace metering devices.
8. Perform test and repair/replace refrigerant lines and fittings.
9. Perform test and repair/replace condensers.
10. Perform test and repair/replace evaporators.
11. Perform test and repair/replace compressors.
12. Perform test and repair/replace electrical components.
13. Perform test and repair/replace solid-state control devices.
14. Perform test and repair/replace temperature control devices.
15. Perform test and repair/replace fan/blower motors.
16. Perform test and replace defective lights.
17. Replace defective accessories.
18. Perform test and repair/replace water tower components.
19. Check and repair/replace refrigerator trim.
20. Evacuate a commercial refrigeration system.
21. Clean a commercial refrigeration system after compressor "burn-out" indications.
22. Purge and dehydrate a commercial refrigeration system.
23. Select refrigerant and charge a commercial refrigeration system.
24. Adjust metering devices.
25. Determine tubing/piping sizes required for installations.
26. Demonstrate the ability to install a commercial refrigeration unit.
27. Evaluate a commercial refrigeration installation.

28. Identify safety hazards associated with commercial refrigeration.
29. Apply local, state, and national codes.
30. Apply safety practices.

UNIT XIV: Business Practices

Competencies:

1. Identify terms associated with business practices.
2. Demonstrate a knowledge of inventory control and management.
3. Demonstrate a knowledge of the cost factors involved in doing business.
4. Maintain service vehicle inventory.
5. Maintain service vehicles.
6. Maintain tools and test equipment.
7. Demonstrate a knowledge of the effects of productivity in service operations.
8. Demonstrate a knowledge of codes and regulations governing employer and employee relations.
9. Demonstrate a knowledge of local, state, and federal tax requirements for doing business.
10. Demonstrate a knowledge of technician license requirements.
11. Obtain required technician's license from local, state, or federal agencies.
12. Complete job scope forms and documents.

UNIT XV: Job Seeking Skills

Competencies:

1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.
5. Write a letter of application.
6. Complete a job application.
7. Participate in a mock interview.
8. Write a follow-up letter.
9. Conduct a job search.
10. Write a letter of resignation.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Trade and Industrial

Course Title: Appliance Repair

CIP Code: 47.0106

Course Length 1350 Clock Hours - 12 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical shop experience to prepare students for employment in a variety of jobs in the field of Appliance Repair or to provide supplemental training for persons previously or currently employed in Appliance Repair.

This course generally prepares individuals to repair, install, and service major gas, electric, and microwave consumer appliances such as stoves, refrigerators, window unit air conditioners, dryers, water heaters, washers, dishwashers, garbage disposers, and trash compactors. It also includes instruction in electrical circuitry, simple gearing, linkages and lubrication of machines and appliances, and the use of testing equipment.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The content is organized into competency-based units of instruction which specify occupational competencies which the student must successfully complete.

Units of Instruction:

I. Introduction to Appliance Repair
II. Tools, Equipment, and Materials
III. Basic Electricity/Electronics
IV. Non-Refrigerated Appliances
V. Refrigerated Appliances
VI. Business Practices
VII. Customer Service and Human Relations
VIII. Job Seeking Skills

Curriculum Competency Outline

UNIT I: Introduction to Appliance Repair

Competencies:

1. Identify terms associated with appliance repair.
2. Demonstrate a knowledge of job requirements.
3. Demonstrate a knowledge of the working conditions of an appliance repair technician
4. Demonstrate a knowledge of career opportunities.
5. Demonstrate a knowledge of codes, standards, and regulations.
6. Identify the safety hazards associated with appliance repair.

UNIT II: Tools, Equipment, and Materials

Competencies:

1. Identify terms associated with tools and materials.
2. Identify various types of hand tools.
3. Demonstrate proper use, safety and care of hand tools.
4. Identify various types of power tools—portable and stationary.
5. Demonstrate proper use, safety, and care of power tools—portable and stationary.
6. Identify various types of test equipment—electrical and mechanical.

7. Demonstrate proper use, safety, and care of test equipment--electrical and mechanical.
8. Identify types of soldering equipment.
9. Identify various types of measuring instruments/devices.
10. Identify tubing by name, size, and application (copper, aluminum and steel).
11. Demonstrate the ability to select, cut, bend, flare, and swage tubing.
12. Identify brass and copper pipe fittings by name, type, and size.
13. Identify Acrylonitrile Butadiene Styrene (ABS), Polyethylene (PE), Polyvinyl Chloride (PVC), Chlorinated Polyvinyl Chloride (CPVC), air conditioning and refrigeration tubing (ACR), stainless steel, steel, wrought iron and black iron piping by name, type, and size.
14. Demonstrate the ability to perform soldering techniques.
15. Demonstrate the ability to cut and thread pipe.
16. Demonstrate the ability to perform chemical bonding techniques on nonmetallic pipe/tubing.
17. Identify various types of metal fasteners.
18. Select and install metal fasteners.
19. Demonstrate the proper selection, use, safety, and care of measuring instruments/devices.
20. Identify various types of refrigerants.
21. Identify color codes used on refrigerant cylinders.
22. Identify type of refrigerant being used in a designated refrigeration/cooling unit.
23. Identify various types of lubricants.
24. Select and use correct lubricants.
25. Identify various types of sealants.
26. Apply various types of sealants.
27. Identify various types of insulation materials.
28. Apply insulation materials.
29. Identify various types of desiccants.
30. Demonstrate the proper selection, use, and installation of desiccant charges in system.
31. Identify various types of leak detectors.
32. Demonstrate the ability to select and use a leak detector to service a system.
33. Identify various types of electric wiring connectors.
34. Demonstrate the ability to select and install electric wiring and connectors.
35. Identify various types of fire extinguishers.
36. Demonstrate the ability to select and use various types of fire extinguishers.
37. Identify various types of personal safety equipment.
38. Use personal safety equipment in the performance of job-scope operations.
39. Identify safety hazards associated with tools, equipment, and materials.
40. Apply safety practices.

UNIT III: Basic Electricity/Electronics

Competencies:

1. Identify terms associated with basic electricity/electronics.
2. Identify electricity/electronics symbols.
3. Identify electricity/electronics components.
4. Describe the operation and functions of various types of electricity/electronics components.
5. Demonstrate the ability to read and interpret electrical diagrams and schematics.
6. Demonstrate the ability to apply Ohm's Law in solving problems involving series, parallel, and combination circuits.
7. Demonstrate a knowledge of direct current (dc) theory.
8. Demonstrate a knowledge of alternating current (ac) theory.
9. Identify various types of electric motors.
10. Identify various types of solid-state devices.
11. Demonstrate a knowledge of magnetism/electromagnetism.
12. Identify various types of electrical/electronics measuring devices.

13. Perform voltage, current, and resistance measurements using various types of electrical/electronic measurement instruments.
14. Construct series, parallel, and combination circuits.
15. Identify safety hazards associated with basic electricity/electronics.
16. Apply safety practices.

UNIT IV: Non-Refrigerated Appliances

Competencies:

1. Identify terms associated with non-refrigerated appliances.
2. Identify various types of non-refrigerated appliances.
3. Describe the operation and function of various types of non-refrigerated appliances.
4. Describe the use and care of various types of non-refrigerated appliances.
5. Identify the major components and controls of various types of non-refrigerated appliances.
6. Identify the electrical components of various types of non-refrigerated appliances.
7. Identify the mechanical components of various types of non-refrigerated appliances.
8. Read and interpret electrical diagrams and/or schematics.
9. Read and interpret service and/or parts manuals.
10. Draw electrical ladder diagrams.
11. Demonstrate the ability to perform installation techniques of various types of non-refrigerated appliances according to manufacturer's specifications.
12. Evaluate a non-refrigerated appliance installation.
13. Demonstrate the ability to perform diagnostic procedures on various types of non-refrigerated appliances.
14. Demonstrate the ability to analyze, troubleshoot, and repair/replace defective components on various types of non-refrigerated appliances.
15. Identify the safety hazards associated with the installation and service/repair of various types of non-refrigerated appliances.
16. Apply safety practices.

UNIT V: Refrigerated Appliances

Competencies:

1. Identify terms associated with refrigeration/cooling systems.
2. Demonstrate a knowledge of the basic laws of heating and cooling.
3. Explain the basic principles of refrigeration.
4. Identify refrigeration system components.
5. Demonstrate knowledge of refrigerants and pressure temperature relationship.
6. Demonstrate knowledge of compressors: construction/operation.
7. Demonstrate knowledge of evaporators: construction/operation.
8. Demonstrate knowledge of condensers: construction/operation.
9. Demonstrate knowledge of metering devices: construction/operation.
10. Apply factors concerning latent and sensible heat to the operation of a refrigeration system.
11. Demonstrate knowledge of accessory components of a refrigeration system: construction/operation.
12. Identify and locate ports to mount gauges for test/service purposes.
13. Locate and interpret component data plates.
14. Describe the basic techniques used to evacuate a refrigeration/cooling system.
15. Describe the basic techniques used to clean a refrigeration/cooling system.
16. Describe the basic techniques used to dehydrate a refrigeration/cooling system.
17. Describe the basic techniques used to charge a refrigeration/cooling system with refrigerant.
18. Demonstrate the ability to evacuate, clean, and dehydrate/charge refrigeration and cooling systems.
19. Identify and describe the characteristics of psychrometric charts.

20. Utilize psychrometric charts to determine the properties of air to be conditioned.
21. Measure and record wet and dry bulb temperatures.
22. Determine relative humidity of entering/leaving air.
23. Evaluate refrigerant pipe sizing.
24. Identify terms associated with domestic refrigeration.
25. Identify various types of domestic refrigerators/freezers.
26. Identify the component parts of domestic refrigerators/freezers.
27. Identify accessory components of domestic refrigerators/freezers (ice makers, beverage dispensers, etc.).
28. Identify control devices found on domestic refrigerators/freezers.
29. Read and interpret data plates.
30. Construct ladder diagrams.
31. Identify and locate control devices.
32. Describe the operation and function of control devices.
33. Demonstrate a knowledge of thermostat to temperature controls at a given temperature reference.
34. Install and check operation of a domestic unit.
35. Evaluate the installation of a domestic unit.
36. Apply troubleshooting techniques for refrigeration systems.
37. Read and interpret refrigeration equipment electrical diagrams.
38. Identify, select, and properly use instruments/gauges (electrical, electronic, temperature, vacuum etc.).
39. Perform electrical continuity test, voltage check, and current check with appropriate meter.
40. Evacuate a domestic unit.
41. Charge a sealed-type domestic system with proper refrigerant.
42. Perform tests, locate, and repair refrigerant leaks.
43. Perform tests and replace hermetic compressor.
44. Perform tests and repair/replace automatic expansion valves.
45. Perform tests and repair/replace capillary-tube refrigerant controls.
46. Perform tests and repair/replace thermostatic expansion valves.
47. Repair/replace bimetal temperature controls.
48. Perform minor motor repairs.
49. Perform tests, remove and install drier.
50. Perform tests and make diagnosis of electrical system.
51. Perform tests and adjust/replace unit control devices.
52. Perform tests and replace hot-wire relay.
53. Perform tests and replace starting current relay.
54. Perform tests and repair/replace defrost—hot-gas/electric.
55. Check, test, and repair/replace automatic ice maker.
56. Inspect, remove, and replace/install door seals.
57. Inspect, remove, and replace/install breaker trim.
58. Check and adjust cabinet door.
59. Check and replace/install door hardware.
60. Perform tests and remove/replace electric motors.
61. Perform tests and remove/replace thermostats.
62. Perform tests and remove/replace defrost terminators.
63. Troubleshoot/repair condenser problems.
64. Troubleshoot/repair evaporator problems.
65. Read and interpret parts/service manuals.
66. Identify safety hazards associated with domestic refrigeration.
67. Apply safety practices.

UNIT VI: Business Practices

Competencies:

1. Identify terms associated with business practices.
2. Demonstrate a knowledge of inventory control and management.
3. Demonstrate a knowledge of the cost factors involved in doing business.
4. Demonstrate a knowledge of the effects of productivity in performing service operations.
5. Maintain tools and test equipment.
6. Demonstrate a knowledge of the codes governing appliance service operations.
7. Demonstrate a knowledge of technician license requirements.
8. Maintain service equipment.
9. Read and interpret electrical/mechanical schematics/diagrams.
10. Read and interpret parts/service manuals.
11. Maintain parts/service manual revisions.
12. Complete job scope forms and documents.

UNIT VII: Customer Service and Human Relations

Competencies:

1. Demonstrate the ability to speak effectively.
2. Demonstrate a willingness to learn.
3. Demonstrate a professional attitude.
4. Demonstrate the ability to be a good listener.
5. Demonstrate the ability to follow oral and written instructions.
6. Demonstrate the ability to communicate instructions accurately and effectively.
7. Demonstrate high reliability in the performance of duties.
8. Demonstrate problem-solving skills.
9. Demonstrate punctuality.
10. Exhibit pride and loyalty.
11. Comply with safety and health rules.
12. Demonstrate personal hygiene and cleanliness.
13. Show empathy, respect, and support for others.
14. Write legibly.
15. Practice good telephone etiquette.
16. Demonstrate equipment operation.
17. Determine the problem and formulate a plan.
18. Perform the service.
19. Complete the transaction.

UNIT VIII: Job Seeking Skills

Competencies:

1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.
5. Write a letter of application.
6. Complete a job application.
7. Participate in a mock interview.
8. Write a follow-up letter.
9. Conduct a job search.
10. Write a letter of resignation.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Trade and Industrial **Course Title:** Auto Body Repair

CIP Code: 47.0603 **Course Length** 2025 Clock Hours - 18 Months

Course Description:

The purpose of this course is to prepare individuals to repair automobile and truck bodies. This includes inspecting vehicle for damage, cutting and welding, straightening sheet metal, replacing body panels, trim and glass, straightening frames, and painting.

The course content is organized into competency-based units of instruction that specify occupational competencies which the student must successfully complete.

Units of Instruction:

I. Orientation and Safety
II. Tools, Equipment and Materials
III. Automotive Electrical
IV. Welding and Cutting
V. Basic Metal Roughout
VI. Metal Finishing
VII. Panel Replacement
VIII. Frame Straightening
IX. Plastic Repair
X. Automotive Trim and Glass
XI. Refinishing
XII. Estimating
XIII. Job Seeking Skills

Curriculum Competency Outline

UNIT I: Orientation and Safety

Competencies:

1. Describe school rules and regulations.
2. Interpret course overview.
3. Discuss working conditions.
4. Identify proper clothing.
5. Explain conduct and attitude.
6. Demonstrate personal safety equipment.
7. Define general shop safety.
8. Identify terms associated with auto body repair.
9. Classify areas of employment.
10. Describe shop layout.

UNIT II: Tools, Equipment and Materials

Competencies:

1. Identify hand tools.
2. Identify power tools.
3. Identify frame equipment.

4. Identify body materials.
5. Identify fastening devices.

UNIT III: Automotive Electrical

Competencies:
1. Read and interpret a wiring diagram.
2. Make wire splices and connections.
3. Remove and replace electrical components as applied to auto body repair.

UNIT IV: Welding and Cutting

Competencies:
1. Apply safety procedures.
2. Set up oxyacetylene equipment.
3. Perform butt welds using oxyacetylene equipment.
4. Perform lap welds using oxyacetylene equipment.
5. Perform brazing techniques.
6. Perform cutting techniques.
7. Set up MIG welding equipment.
8. Perform butt welds using MIG equipment.
9. Perform lap welds using MIG equipment.
10. Perform spot welds.
11. Set up electrical resistance spot weld equipment.
12. Perform lap joint welding.

UNIT V: Basic Metal Roughout

Competencies:
1. Determine panel dimensions.
2. Use portable power equipment.
3. Use hammer and dolly.
4. Use vacuum cup and slide hammer.
5. Use pull rod.
6. Use body pick.
7. Heat-shrink raised metal.
8. Heat-shrink stretched metal.
9. Use pry bar.

UNIT VI: Metal Finishing

Competencies:
1. Grind, pick, and file a flat panel.
2. Grind, pick, and file a high crown panel.
3. Grind, pick, and file a low crown panel.
4. Grind, pick, and file a groove.
5. Perform final grind operations.
6. Mix, apply, and finish plastic body filler and fiberglass resin.
7. Make panel repairs using fiberglass.

UNIT VII: Panel Replacement

Competencies:
1. Remove and replace front fender and grille.
2. Remove and replace the front-end assembly.
3. Remove and replace a hood or deck lid.
4. Remove and replace a door.
5. Repanel a door.
6. Replace rocker panel.
7. Remove and replace a new quarter panel and lower deck panel.
8. Remove and replace a used quarter panel.
9. Remove and replace a new top panel.
10. Remove and replace a used top panel.

11. Remove and install a rear body clip.
12. Align a damaged fender.
13. Align a damaged cowl.
14. Align a damaged door panel with vacuum equipment.
15. Align side damage.
16. Align top damage.
17. Align rear section damage.

UNIT VIII: Frame Straightening

Competencies:

1. Troubleshoot frame damage on conventional frame using self-centering gauges and tram gauges.
2. Straighten and align mash conventional frame damage.
3. Straighten and align sag conventional frame damage.
4. Straighten and align twist conventional frame damage.
5. Straighten and align sway conventional frame damage.
6. Straighten and align diamond frame damage.
7. Troubleshoot frame damage on unitized frame using self-centering gauges and tram gauge.
8. Straighten and align mash unitized frame damage.
9. Straighten and align sag unitized frame damage.
10. Straighten and align twist unitized frame damage.
11. Straighten and align sway unitized frame damage.

UNIT IX: Plastic Repair

Competencies:

1. Identify types of plastic materials.
2. Perform plastic welding techniques.
3. Apply structural adhesives.
4. Repair hard plastics using bonding materials.
5. Perform urethane patching and repair techniques.

UNIT X: Automotive Trim and Glass

Competencies:

1. Remove, repair and replace interior trim.
2. Remove and replace exterior trim.
3. Remove and replace a vent glass.
4. Remove and replace a door glass having a vent glass.
5. Remove and replace a door glass without a vent glass.
6. Remove and replace a rear tailgate glass.
7. Remove and replace a gasket-type windshield or back glass.
8. Remove and replace gasketless-type windshield or back glass.
9. Remove and replace a manual window regulator.
10. Remove and replace an electric window regulator.
11. Remove and replace a vent window assembly.
12. Remove and replace an inside remote control.
13. Remove and replace a door lock cylinder.
14. Remove and replace a door latch.
15. Remove and replace an outside door handle.
16. Remove and replace a center division channel.
17. Remove and replace a run channel.
18. Remove and replace a door weather strip.

UNIT XI: Refinishing

Competencies:

1. Use and maintain paint gun, suction feed.
2. Use and maintain pressure feed.

3. Use and maintain gravity feed.
4. Use dual action sander.
5. Use blower gun.
6. Use viscosity cup.
7. Operate air transformer/regulator.
8. Clean surface.
9. Featheredge a painted surface.
10. Wet-sand for a complete paint job.
11. Dry-sand a complete car.
12. Sand a spot repair.
13. Sand a panel repair.
14. Sand painted surfaces.
15. Remove paint with a sander.
16. Remove paint with paint remover.
17. Mask for a primer.
18. Mask for a spot repair.
19. Mask for a panel repair.
20. Mask for a complete paint job.
21. Use the paint gun with proper technique.
22. Mix paint.
23. Apply undercoats and primer surfacer and sealer.
24. Apply top coats.
25. Perform a spot repair.
26. Perform a panel repair.
27. Match colors.
28. Spray acrylic lacquer color coat.
29. Spray enamel color coat.
30. Spray urethane color coat.
31. Spray base coat, clear coat.
32. Compound, polish, and detail a spot or panel repair.
33. Compound, polish, and detail a complete acrylic lacquer job.
34. Detail a complete enamel paint job.
35. Apply pin striping.

UNIT XII: Estimating

Competencies:

1. Read and interpret an estimate.
2. Order parts.
3. Use collision estimating guide.

UNIT XIII: Job Seeking Skills

Competencies:

1. Select means of locating job openings.
2. Prepare a resume'.
3. Write a letter of application.
4. Complete an employment application.
5. Participate in a mock interview.
6. Write a follow-up letter.
7. Make a follow-up phone call.
8. Evaluate a job offer.
9. Compare job opportunities.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Trade and Industrial
Course Title: Automotive Technician

CIP Code: 47.0604
Course Length 2700 Clock Hours - 24 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical shop experience to prepare individuals to engage in the servicing and maintenance of all types of automobiles. The course prepares the individual to select, safely use and maintain hand and power tools, jacks, and hoisting equipment. Includes instruction in the diagnosis of malfunctions in and repair of engines; fuel, electrical, cooling, and brake systems; drive train; and suspension systems. Knowledge and skills are also developed in the adjustment and repair of individual components and systems such as radiators, transmissions, and carburetors. Safe and efficient work practices are emphasized and basic occupational and employability skills are an integral part of instruction. The content is organized into competency-based units of instruction which specify occupational competencies the individual must successfully complete.

Units of Instruction:
I. Occupational Introduction
II. Safety
III. Tools and Equipment
IV. Basic Engines
V. Drive Train
VI. Brakes
VII. Steering and Suspension Systems
VIII. Heating and Air Conditioning
IX. Cooling Systems
X. Electricity/Electronics
XI. Ignition Systems
XII. Fuel Systems
XIII. Emission Control Systems
XIV. Job Seeking Skills

Curriculum Competency Outline

UNIT I: Occupational Introduction

Competencies:
1. Describe the field of automotive mechanics.
2. Identify working conditions involved with automotive mechanics.
3. List salary and benefits associated with employment in the automotive technician field.
4. Describe job opportunities available for the automotive technician.
5. Identify initial investment requirements for professional mechanics.
6. Demonstrate a willingness to learn.
7. Prepare written communication.
8. Exhibit dependability.
9. Demonstrate punctuality.
10. Follow rules and regulations.
11. Read and comprehend written communication and information found in technical manuals.

12. Use technical manuals effectively.
13. Maintain clean and orderly work area.
14. Demonstrate personal hygiene and cleanliness.
15. Comply with safety and health rules.
16. Select correct tools and equipment.
17. Utilize equipment correctly.
18. Work productively with others.
19. Exhibit pride and loyalty.
20. Demonstrate problem-solving skills.

UNIT II: Safety

Competencies:

1. Identify shop hazards.
2. Identify and wear personal attire for the work environment.
3. Identify safe and proper use of equipment.
4. Demonstrate proper lifting techniques.
5. Identify chemical hazards.
6. Identify toxic waste disposal procedures.
7. Locate fire extinguishers.
8. Demonstrate a knowledge of cooling system hazards.
9. Demonstrate proper use of jackstands and floor hoists.
10. Identify hazards associated with battery servicing.
11. Wear safety goggles.
12. Identify safety hazards associated with servicing air conditioning equipment on automobiles.
13. Demonstrate a knowledge of compressed air safety.
14. Demonstrate a knowledge of the fire triangle.
15. Apply shop and equipment safety rules.
16. Identify asbestos hazards associated with the automotive industry.

UNIT III: Tools and Equipment

Competencies:

1. Identify various types of handtools used by the automotive technician.
2. Demonstrate the ability to use handtools correctly.
3. Identify various types of test instruments used by the automotive technician.
4. Demonstrate the ability to use test instruments correctly.
5. Identify various types of lifting and hoisting devices.
6. Demonstrate the ability to use various lifting and hoisting devices.
7. Identify various power tools used by the automotive technician.
8. Demonstrate the ability to use power tools correctly.
9. Identify precision measuring instruments used in the automotive trade.
10. Demonstrate the ability to use precision measuring instruments correctly.

UNIT IV: Basic Engines

Competencies:

1. Identify various engine types.
2. Explain the principles of operation of a four-stroke cycle engine.
3. Disassemble and reassemble an automotive engine outside of chassis without emission and electronic connections.
4. Identify the components of an automotive engine.
5. Perform preventive maintenance on engine lubrication system according to manufacturer's specifications.

UNIT V: Drive Train

Competencies:

1. Identify the components of a drive train.
2. Remove and replace standard transmission clutch according to manufacturer's specifications.
3. Check fluid level in an automatic transmission according to manufacturer's specifications.
4. Remove and replace an automatic transmission according to manufacturer's specifications.
5. Disassemble, identify components, and reassemble an automatic transmission according to manufacturer's specifications.
6. Demonstrate a knowledge of the principles of hydraulics in an automatic transmission.
7. Remove and replace drive shafts according to manufacturer's specifications.
8. Remove and replace universal joints according to manufacturer's specifications.
9. Remove and replace a rear axle assembly according to manufacturer's specifications.
10. Disassemble and reassemble a rear axle assembly according to manufacturer's specifications.

UNIT VI: Brakes

Competencies:

1. Identify the components of a typical brake system.
2. Demonstrate a knowledge of hydraulics as applied to a brake system.
3. Overhaul brake calipers according to manufacturer's specifications.
4. Overhaul wheel cylinders according to manufacturer's specifications.
5. Overhaul master cylinders according to manufacturer's specifications.
6. Describe the operation of a vacuum booster.
7. Describe the operation of a hydraulic booster.
8. Measure and turn rotors according to manufacturer's specifications.
9. Measure and turn brake drums according to manufacturer's specifications.
10. Pressure bleed brake system according to manufacturer's specifications.
11. Remove, clean, inspect and replace front wheel bearings.
12. Check and service parking brakes according to the manufacturer's specifications.
13. Diagnose brake noises.

UNIT VII: Steering and Suspension Systems

Competencies:

1. Identify the components of steering and suspension systems.
2. Inspect steering and suspension systems for wear according to manufacturer's specifications.
3. Identify tire wear patterns.
4. Perform two-wheel alignments.
5. Perform wheel balancing on vehicle and off vehicle with computerized equipment and without computerized equipment.
6. Remove and replace shocks according to manufacturer's specifications.
7. Remove and replace ball joints according to manufacturer's specifications.
8. Remove and replace bushings according to manufacturer's specifications.
9. Remove and replace McPherson strut according to manufacturer's specifications.
10. Remove and replace tie rod ends according to manufacturer's specifications.
11. Remove and replace center link according to manufacturer's specifications.
12. Remove and replace idler arm according to manufacturer's specifications.
13. Remove and replace steering gear box according to manufacturer's specifications.
14. Remove and replace power steering according to manufacturer's specifications.

UNIT VIII: Heating and Air Conditioning

Competencies:

1. Identify heating and air conditioning system components.
2. Demonstrate a knowledge of the principles of operation of a typical heating and air conditioning system.

3. Evacuate and recharge an air conditioning system according to manufacturer's specifications.
4. Leak test an air conditioning system according to manufacturer's specifications.
5. Flush an air conditioning system according to manufacturer's specifications.
6. Describe the theory and operation of a basic five-part refrigerant system.
7. Describe the theory and operation of a suctioning throttling valve (STV) system.
8. Describe the theory and operation of orifice tube air conditioning system.

UNIT IX: Cooling Systems

Competencies:

1. Identify cooling system components according to manufacturer's specifications.
2. Pressure test cooling systems according to manufacturer's specifications.
3. Remove and replace radiators according to manufacturer's specifications.
4. Remove and replace belts and hoses according to manufacturer's specifications.
5. Remove and replace thermostats according to manufacturer's specifications.
6. Remove and replace water pumps according to manufacturer's specifications.
7. Test coolant for freeze protection according to manufacturer's specifications.
8. Flush cooling systems according to manufacturer's specifications.
9. Remove and replace idler pulley according to manufacturer's specifications.
10. Pressure test radiator cap for correct operation according to manufacturer's specifications.
11. Check, remove and replace fan clutch according to manufacturer's specifications.
12. Test water pump flow according to manufacturer's specifications.
13. Determine correct amount of antifreeze required per cooling system capacity and manufacturer's specifications.

UNIT X: Electricity/Electronics

Competencies:

1. Demonstrate a knowledge of basic electrical principles as applied to the automobile.
2. Demonstrate the ability to read and interpret automotive wiring diagrams.
3. Trace a basic electrical circuit on an automobile according to manufacturer's specifications.
4. Test a starter for current draw according to manufacturer's specifications.
5. Test an alternator for amperage and voltage output according to manufacturer's specifications.
6. Splice wire, solder and solderless according to manufacturer's specifications.
7. Disconnect and reconnect conductors according to manufacturer's specifications.
8. Replace connectors according to manufacturer's specifications.
9. Test an alternator for correct operation of the stator, fields and diodes according to manufacturer's specifications.
10. Remove and replace an alternator according to manufacturer's specifications.
11. Perform voltage drop test on batteries according to manufacturer's specifications.
12. Perform battery load tests according to manufacturer's specifications.
13. Remove and replace starter according to manufacturer's specifications.
14. Disassemble starter and test components for correct operation according to manufacturer's specifications.
15. Demonstrate a knowledge of series and parallel circuits.
16. Test a relay for correct operation using a digital volt-ohm meter according to manufacturer's specifications.
17. Test a solenoid for correct operation according to manufacturer's specifications.
18. Recognize and test variable resistance sensors according to manufacturer's specifications.
19. Recognize and test a vacuum control switch according to manufacturer's specifications.
20. Demonstrate a basic knowledge of feedback control circuits.
21. Pull codes from engine microprocessor using the self-diagnostic system on the car.

22. Test the engine microprocessor to determine if the engine is in open loop or closed loop according to the manufacturer's specifications.
23. Demonstrate a knowledge of electrical inputs and outputs as they apply to the engine microprocessor.
24. Demonstrate logical electrical troubleshooting skills according to manufacturer's specifications.

UNIT XI: Ignition Systems

Competencies:

1. Identify the components of an electronic ignition system according to manufacturer's specifications.
2. Test a Hall-effect and inductive ignition system according to manufacturer's specifications.
3. Remove, disassemble, reassemble, install and time an ignition distributor according to manufacturer's specifications.
4. Test a primary ignition circuit according to manufacturer's specifications.
5. Test a secondary ignition circuit according to manufacturer's specifications.
6. Test an electronic spark control (E.S.C.) system for correct operation according to manufacturer's specifications.
7. Remove, adjust, replace spark plugs according to manufacturer's specifications.
8. Read, understand and interpret an engine analyzer (oscilloscope) according to manufacturer's specifications.
9. Test and replace secondary ignition wires according to manufacturer's specifications.
10. Interpret spark plug insulator color according to manufacturer's specifications.

UNIT XII: Fuel Systems

Competencies:

1. Identify and describe the function of the components in a basic carbureted fuel system with no computer.
2. Identify and describe the function of the components in a carbureted fuel system operating with a computer.
3. Identify and describe the function of the components in a throttle body fuel injection system.
4. Identify and describe the function of the components in a multi-port fuel injected system.
5. Overhaul a two-barrel carburetor according to manufacturer's specifications.
6. Install and adjust a two-barrel carburetor for correct operation on an engine according to manufacturer's specifications.
7. Adjust a computerized carburetor according to manufacturer's specifications.
8. Perform pulse test and flow test on a throttle body injector according to manufacturer's specifications.
9. Perform pressure clean and balance test on multi-port injectors according to manufacturer's specifications.
10. Remove and replace a mechanical fuel pump according to manufacturer's specifications.
11. Perform fuel pressure test for high and low pressure systems according to manufacturer's specifications.
12. Remove and replace fuel tanks according to manufacturer's specifications.
13. Remove and replace fuel lines according to manufacturer's specifications.

UNIT XIII: Emission Control Systems

Competencies:

1. Identify and explain the functions of the components of an emission control system according to manufacturer's specifications.
2. Test a positive crankcase ventilation (P.C.V.) system according to manufacturer's specifications.

3. Remove and replace a P.C.V. valve.
4. Test evaporation emission control systems according to manufacturer's specifications.
5. Remove and replace a charcoal canister filter according to manufacturer's specifications.
6. Remove and replace a catalytic converter according to manufacturer's specifications.
7. Test the backpressure of exhaust systems according to manufacturer's specifications.
8. Test air injection system for correct operation according to manufacturer's specifications.
9. Test an exhaust gas recirculation (E.G.R.) valve for correct operation according to manufacturer's specifications.
10. Remove and replace air injection pump according to manufacturer's specifications.
11. Remove, clean and replace an E.G.R. valve.
12. Test emission control system using propane enrichment.
13. Test and service heated air induction system according to manufacturer's specifications.

UNIT XIV: Job Seeking Skills

Competencies:

1. Locate resources for finding employment.
2. Locate job openings.
3. Prepare a resume'.
4. Participate in a mock interview.
5. Complete a job application form.
6. Write an application letter.
7. Write a follow-up letter.
8. Evaluate job rejection.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education
Competency-Based Course Outline

Program Area: Trade and Industrial **Course Title:** Aviation Maintenance Technology

CIP Code: 47.0602 **Course Length** 1913 Clock Hours - 17 Months

Course Description:

The purpose of this course is to prepare individuals to inspect, repair, service and overhaul aircraft components such as engines, propellers, instruments, airframes, fuel and oil tanks, control cables, and hydraulic units. The course prepares the individual to select, safely use and maintain hand and power tools, jacks, and hoisting equipment. The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, and safe and efficient work practices. Included are Federal Aviation Regulations (FAR) Part 65 pertaining to eligibility for a mechanic certificate and ratings. The course is designed to meet Federal Aviation Administration requirements for licensing as an airframe/powerplant mechanic. The course content is organized into competency-based units of instruction that specify occupational competencies which the individual must successfully complete.

Units of Instruction:

I. Occupational Introduction
II. General Aviation
III. Airframe Structures
IV. Airframe Systems and Components
V. Powerplant Theory and Maintenance
VI. Powerplant Systems and Components
VII. Job Seeking Skills

Curriculum Competency Outline

UNIT I: Occupational Introduction

Competencies:

1. Describe the field of aviation mechanics.
2. Identify working conditions involved with aviation mechanics.
3. Identify job hazards associated with the field of aviation mechanics.
4. List salary and benefits associated with employment in the aviation mechanics field.
5. Describe the job opportunities available for aviation mechanics.
6. Identify initial investment requirements for professional mechanics.
7. Demonstrate willingness to learn.
8. Write legibly.
9. Listen attentively.
10. Prepare written communications.
11. Exhibit dependability.
12. Demonstrate punctuality.
13. Follow rules and regulations.
14. Read and comprehend written communication and information found in technical manuals.
15. Use technical manuals effectively.
16. Maintain clean and orderly work area.

17. Demonstrate personal hygiene and cleanliness.
18. Comply with safety and health rules.
19. Select correct tools and equipment.
20. Utilize equipment correctly.
21. Work productively with others.
22. Exhibit pride and loyalty.
23. Demonstrate problem-solving skills.
24. Show empathy, respect, and support for others.

UNIT II: General Aviation

Competencies:

1. Measure capacitance and inductance.
2. Calculate and measure electrical power.
3. Measure voltage, current, resistance, continuity, and leakage.
4. Determine the relationship of voltage, current, and resistance in electrical circuits.
5. Read and interpret electrical circuit diagrams.
6. Inspect and service batteries.
7. Use drawings, symbols, and schematic diagrams.
8. Draw sketches of repairs and alterations.
9. Use blueprint information.
10. Use graphs and charts.
11. Weigh aircraft.
12. Perform complete weight-and-balance check and record data.
13. Fabricate and install rigid and flexible fluid lines and fittings.
14. Identify and select appropriate nondestructive testing methods.
15. Perform penetrant, chemical etching, and magnetic particle inspections.
16. Perform basic heat-treating processes.
17. Identify and select aircraft hardware and materials.
18. Inspect and check welds.
19. Perform precision measurements.
20. Start, ground operate, move, service, and secure aircraft.
21. Identify and select fuels.
22. Identify and select cleaning materials.
23. Perform aircraft cleaning and corrosion control.
24. Extract roots and raise numbers to a given power.
25. Determine areas and volumes of various geometrical shapes.
26. Solve ratio, proportion, and percentage problems.
27. Perform algebraic operations involving addition, subtraction, multiplication, and division of positive and negative numbers.
28. Write descriptions of aircraft condition and work performed.
29. Complete required maintenance forms, records, and inspection reports.
30. Use the principles of simple machines: sound, fluid, and heat dynamics.
31. Select and use FAA and manufacturer's aircraft maintenance specifications, data sheets, manuals, publications, and related Federal Aviation Regulations.
32. Read technical data.
33. Exercise mechanic privileges within the limitations prescribed by Part 65 of this chapter.

UNIT III: Airframe Structures

Competencies:

1. Service and repair wood structures.
2. Identify wood defects.
3. Inspect wood structures.
4. Select and apply fabric and fiberglass covering materials.
5. Inspect, test, and repair fabric and fiberglass.

6. Apply trim, letters, and touch-up paint.
7. Identify and select aircraft finishing materials.
8. Apply paint and dope.
9. Inspect finishes and identify defects.
10. Install special rivets and fasteners.
11. Inspect bonded structures.
12. Inspect and repair plastics, honeycomb, and laminated structures.
13. Inspect, check, service, and repair windows, doors, and interior furnishings.
14. Inspect and repair sheet-metal structures.
15. Install conventional rivets.
16. Hand form, lay out, and bend sheet metal.
17. Weld magnesium and titanium.
18. Solder stainless steel.
19. Fabricate tubular structures.
20. Solder, braze, gas-weld, and arc-weld steel.
21. Weld aluminum and stainless steel.
22. Rig rotary-wing aircraft.
23. Rig fixed-wing aircraft.
24. Check alignment of structures.
25. Assemble aircraft.
26. Balance and rig movable surfaces.
27. Jack aircraft.
28. Perform airframe conformity and airworthiness inspections.

UNIT IV: Airframe Systems and Components

Competencies:

1. Inspect, check, service, and repair landing gear, retraction systems, shock struts, brakes, wheels, tires, and steering systems.
2. Repair hydraulic and pneumatic power systems components.
3. Identify and select hydraulic fluids.
4. Inspect, check, service, troubleshoot, and repair hydraulic and pneumatic power systems.
5. Repair heating, cooling, air-conditioning, pressurization, and oxygen system components.
6. Inspect, check, troubleshoot, service, and repair heating, cooling, air-conditioning, and pressurization systems.
7. Inspect, check, troubleshoot, service and repair oxygen systems.
8. Inspect, check, service, troubleshoot, and repair heading, speed, altitude, time, attitude, temperature, pressure and position indicating systems.
9. Install instruments.
10. Inspect, check, and service auto-pilot and approach control systems.
11. Inspect, check, and service aircraft electronic communication and navigation systems.
12. Inspect and repair antenna and electronic equipment installations.
13. Check and service fuel dump systems.
14. Perform fuel management, transfer, and defueling.
15. Inspect, check, and repair pressure fueling systems.
16. Repair aircraft fuel system components.
17. Inspect and repair fluid quantity indicating systems.
18. Troubleshoot, service, and repair fluid pressure and temperature warning systems.
19. Inspect, check, service, troubleshoot, and repair aircraft fuel systems.
20. Repair aircraft electrical system components.
21. Install, check, and service airframe electrical wiring, controls, switches, indicators, and protective devices.
22. Inspect, check, troubleshoot, service, and repair alternating current and direct current electrical systems.

23. Inspect, check, and service speed- and takeoff-warning systems, electrical brake controls, and antiskid systems.
24. Inspect, check, troubleshoot, service, and repair landing gear position indicating and warning systems.
25. Inspect, check, troubleshoot, service, and repair airframe ice and rain control systems.
26. Inspect, check, and service smoke and carbon monoxide detection systems.
27. Inspect, check, service, troubleshoot, and repair aircraft fire detection and extinguishing systems.

UNIT V: Powerplant Theory and Maintenance

Competencies:

1. Inspect and repair 14-cylinder or larger radial engine.
2. Overhaul reciprocating engine.
3. Inspect, check, service, and repair opposed and radial engines and reciprocating engine installations.
4. Install, troubleshoot, and remove reciprocating engines.
5. Overhaul turbine engine.
6. Inspect, check, service, and repair turbine engines and turbine engine installations.
7. Install, troubleshoot, and remove turbine engines.
8. Perform powerplant conformity and airworthiness inspections.

UNIT VI: Powerplant Systems and Components

Competencies:

1. Troubleshoot, service, and repair fluid rate-of-flow indicating systems.
2. Inspect, check, service, troubleshoot, and repair engine temperature, pressure, and r.p.m. indicating systems.
3. Inspect, check, service, troubleshoot, and repair engine fire detection and extinguishing systems.
4. Repair engine electrical system components.
5. Install, check, and service engine electrical wiring, controls, switches, indicators, and protective devices.
6. Identify and select lubricants.
7. Repair engine lubrication system components.
8. Inspect, check, service, troubleshoot, and repair engine lubrication systems.
9. Overhaul magneto and ignition harness.
10. Repair engine ignition system components.
11. Inspect, check, service, troubleshoot, and repair reciprocating and turbine engine ignition systems.
12. Inspect, check, and service water injection systems.
13. Overhaul carburetor.
14. Repair engine fuel metering system components.
15. Inspect, check, service, troubleshoot, and repair reciprocating and turbine engine fuel metering system.
16. Repair engine fuel system components.
17. Inspect, check, service, troubleshoot, and repair engine fuel systems.
18. Inspect, check, troubleshoot, service, and repair engine ice and rain control systems.
19. Inspect, check, service, and repair heat exchangers and superchangers.
20. Inspect, check, service, and repair carburetor air intake and induction manifolds.
21. Repair engine cooling system components.
22. Inspect, check, troubleshoot, service, and repair engine cooling systems.
23. Repair engine exhaust system components.
24. Inspect, check, troubleshoot, service, and repair engine exhaust systems.
25. Inspect, check, service, and repair propeller synchronizing and ice control systems.
26. Identify and select propeller lubricants.
27. Balance propellers.

28. Repair propeller control system components.
29. Inspect, check, service, and repair fixed-pitch, constant-speed, and feathering propellers, and propeller governing systems.
30. Install, troubleshoot, and remove propellers.

UNIT VII: Job Seeking Skills

Competencies:

1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.
5. Write a letter of application.
6. Complete a job application.
7. Participate in a mock interview.
8. Write a follow-up letter.
9. Conduct a job search.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Trade and Industrial

Course Title: Band and Circular Saw Filing

CIP Code: 48.0599

Course Length 2025 Clock Hours - 18 Months

Course Description:

The purpose of this course is to prepare individuals for employment in commercial sawmills as saw filers. The saw filer repairs bandsaw and circular saw blades according to customer or manufacturer's specifications using hand tools, machine tools, and welding equipment. The filer examines saws for defects and repairs them by removing and replacing broken teeth, welding cracks in blades, straightening kinks and removing dents in blades, and sharpening teeth.

The course content is organized into competency-based units of instruction that specify occupational competencies which the student must successfully complete.

Units of Instruction:

I. Occupational Introduction
II. Safety
III. Tools and Equipment
IV. Knife Grinding
V. Circular Saws
VI. Band Saws
VII. General Mill Maintenance and Alignment
VIII. Welding
IX. Job Seeking Skills

Curriculum Competency Outline

UNIT I: Occupational Introduction

Competencies:

1. Describe the occupations of band and circular saw filing.
2. Describe the working conditions of a band and circular saw filer.
3. List and identify proper clothing used by saw filers.
4. List job opportunities and possible salaries available to saw filers.
5. Demonstrate proper job attitude and behavior.
6. Demonstrate personal hygiene and cleanliness.
7. Complete work assignments in an accurate and timely manner.
8. Follow rules and regulations.

UNIT II: Safety

Competencies:

1. Apply shop and equipment safety rules.
2. Apply basic first aid techniques.
3. Demonstrate cardiopulmonary resuscitation techniques (CPR).
4. Inspect work area and equipment for safe working environment.
5. Report safety problems.
6. Apply OSHA regulations related to saw filing.
7. Participate in safety meetings.
8. Demonstrate use of fire extinguishers.
9. Store flammable materials.

UNIT III: Tools and Equipment

Competencies:

1. Identify personal hand tools.
2. Identify personal power tools.
3. Perform maintenance on tools.
4. Identify equipment.

UNIT IV: Knife Grinding

Competencies:

1. Identify types of equipment utilizing knives.
2. Identify types of knife grinders.
3. Identify types and grits of wheels for knife grinders.
4. Install and set up knife grinder.
5. Find the bevel on a chipper knife using a protractor.
6. Find the bevel on a planer knife using a protractor.
7. Grind a chipper knife on a 30 degree bevel.
8. Grind a chipper knife on a 40 degree bevel.
9. Grind a planer knife on a 30 degree bevel.
10. Grind a planer knife on a 40 degree bevel.
11. Grind a complete sidehead knife.
12. Perform general machine maintenance.
13. Troubleshoot knife problems.

UNIT V: Circular Saws

Competencies:

1. Identify types of equipment utilizing circular saw blades.
2. Identify types and designs of circular saw blades.
3. Identify types of circular saw grinders and wheels.
4. Clean a saw blade with a caustic solution.
5. Clean a saw blade with a wire brush.
6. Set up grinder and sharpen a ripsaw.
7. Set up grinder and sharpen a crosscut saw.
8. Set teeth in a crosscut saw blade.
9. Maintain and operate an automatic circular saw grinder.
10. Line faceplate with grinding wheel.
11. Line up feed cam with tooth style cam.
12. Joint a solid tooth crosscut or ripsaw.
13. Gum a solid tooth ripsaw.
14. Gum a solid tooth crosscut saw.
15. Grind bevels on a solid tooth crosscut saw.
16. Grind face on top of solid tooth ripsaw.
17. Review history and types of carbide tipped saws.
18. Set up grinding machine and grind face of a carbide ripsaw.
19. Set up grinding machine and grind top of a carbide ripsaw.
20. Set up grinding machine and grind sides of a carbide ripsaw.
21. Set up grinding machine and grind face of a carbide crosscut saw.
22. Set up grinding machine and grind top of a carbide crosscut saw.
23. Set up grinding machine and grind sides of a carbide crosscut saw.
24. Identify types of grinding problems for carbide tipped blades.
25. Retip a carbide ripsaw.
26. Retip a carbide crosscut saw.
27. Restrobe a carbide saw.
28. Check small circular saw with straightedge for lumps.
29. Check circular saw for runout.
30. Level circular saw.
31. Check circular saw with tension gauge for tension.
32. Tension circular saw for the correct revolutions per minute (RPM).
33. Check saw arbor for level.

34. Check saw collar for proper bevel.
35. Check saw lead.
36. Set up guide dresser and grind guide.
37. Calculate the tooth bite on a saw.
38. Convert RPM to rim speed on a saw.
39. Determine required gullet capacity on a saw.
40. Make a rubbing of the gullets.
41. Perform general machine maintenance.
42. Troubleshoot circular saw problems.

UNIT VI: Band Saws

Competencies:

1. Identify types of equipment utilizing band saws.
2. Sketch a filing room layout.
3. Level all band saw grinders and post brackets.
4. Line up bottom roll on stretcher roll with anvil.
5. Disassemble the band saw swage.
6. Clean all band saw parts.
7. List all band saw parts.
8. Oil the movable parts of a band saw.
9. Reassemble the swage of a band saw.
10. Set swage to a band saw in working order.
11. Disassemble the band saw shaper.
12. Clean all shaper parts.
13. List all shaper parts.
14. Oil the movable parts of a shaper.
15. Reassemble the shaper.
16. Set shaper to a band saw in working order.
17. Perform maintenance and review operational procedures of an automatic band saw grinder.
18. Line up faceplate and square it with the grinder and slide plate.
19. Line up grinding wheel arbor with faceplate of grinder.
20. Line up feed cam with tooth style cam.
21. Set single cut band saw and grinder for grinding.
22. Swage a single cut band saw.
23. Shape a single cut band saw.
24. Line a single cut band saw.
25. Grind a single cut band saw for proper sharpness.
26. File out gullets.
27. Place on leveling bench and level outside of saw.
28. Turn saw and level inside of saw.
29. Roll tension in center of saw.
30. Shorten back of a saw.
31. Lengthen back of a saw.
32. Make tension uniform in entire saw.
33. Pull the back of a saw out to 1/64".
34. Remove twists in a saw.
35. Adjust machine guides.
36. Perform general machine maintenance.
37. Troubleshoot band saw problems.

UNIT VII: General Mill Maintenance and Alignment

Competencies:

1. Align bottom wheel of bandmill to track and set crossline.
2. Align circle saw mandrel.
3. Set circle saw mandrel.
4. Set circle head rig guide to mandrel.

5. Set guide system up for bandmill with no pressure guides.
6. Set guide system up for bandmill with one pressure guide.
7. Set guide system up for bandmill with two pressure guides.
8. Solve strain device problems using formulas.
9. Tape the bottom and top wheels on a bandmill.
10. Set up grinder and grind bottom wheel.
11. Set up grinder and grind top wheel.
12. Retape the bottom and top wheels on a bandmill.

UNIT VIII: Welding

Competencies:

1. Identify and review operation of shielded metal arc welding (SMAW), oxyacetylene, gas tungsten arc welding (GTAW), and gas metal arc welding (GMAW) equipment.
2. Weld a butt joint on a band saw using oxyacetylene welding equipment.
3. Weld a butt joint on a band saw using GMAW equipment.
4. Weld a butt joint on a band saw using GTAW equipment.
5. Weld a crack in a band saw using oxyacetylene welding equipment.
6. Weld a crack in a band saw using GMAW equipment.
7. Weld a crack in a band saw using GTAW equipment.
8. Weld a crack in a circular saw using SMAW equipment.
9. Replace entire tooth in a band saw using oxyacetylene welding equipment.
10. Replace entire tooth in a band saw using GMAW equipment.
11. Replace entire tooth in a band saw using GTAW equipment.
12. Replace entire tooth in a circular saw using SMAW equipment.
13. Repair portion of a tooth with proper welding equipment.
14. Temper welds.

UNIT IX: Job Seeking Skills

Competencies:

1. Prepare a personal resume'.
2. Fill out a job application.
3. Prepare a letter of application.
4. Prepare a follow-up letter.
5. Participate in a mock job interview.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Trade and Industrial **Course Title:** Carpentry

CIP Code: 46.0201 **Course Length** 2025 Clock Hours - 18 Months

Course Description:

The purpose of this course is to prepare individuals to construct wood structures for residential and nonresidential use. This includes using builder's level to lay out construction site, blueprint reading, layout and cutting of structural members, erecting structural members, materials estimating, and finishing interior and exterior.

The course content is organized into competency-based units of instruction that specify occupational competencies which the student must successfully complete.

Units of Instruction:

I. Introduction
II. Lumber, Plywood, and Common Fasteners
III. Hand Tools and Measuring Devices
IV. Power Tools
V. Carpenter's Math
VI. Blueprint Reading and Sketching
VII. Foundations and Formwork
VIII. Floor and Wall Framing
IX. Ceiling and Roof Framing
X. Exterior Finish
XI. Interior Finish
XII. Cabinetmaking
XIII. Job Seeking Skills

Curriculum Competency Outline

UNIT I: Introduction

Competencies:

1. Identify advantages and disadvantages of carpentry work.
2. Identify general shop safety rules.
3. Identify physical demands of the carpentry trade.
4. Identify related construction opportunities.
5. Apply basic first aid techniques.

UNIT II: Lumber, Plywood, and Common Fasteners

Competencies:

1. Identify types of wood.
2. Identify the two major methods of sawing lumber.
3. Identify lumber sizes, grading, and mill shapes.
4. Identify lumber drying and treatment methods.
5. Identify common lumber defects.
6. Identify sizes and grades of plywood.
7. Identify types and sizes of nails.
8. Identify types and sizes of screws and bolts.
9. Identify common types of adhesives.

UNIT III: Hand Tools and Measuring Devices

Competencies:

1. Identify basic measuring devices.
2. Demonstrate correct use of measuring devices.
3. Identify basic layout and checking tools.
4. Apply hand tool safety.
5. Demonstrate correct use of layout and checking tools.
6. Identify and demonstrate ability to use striking tools.
7. Identify and demonstrate ability to use sawing tools.
8. Identify and demonstrate ability to use edge-cutting tools.
9. Demonstrate ability to sharpen cutting tools.
10. Identify and demonstrate ability to use drilling and boring tools.

UNIT IV: Power Tools

Competencies:

1. Apply power tool safety.
2. Identify and demonstrate ability to use circular handsaw.
3. Identify and demonstrate ability to use sabre saw.
4. Identify and demonstrate ability to use reciprocating saw.
5. Identify and demonstrate ability to use hand drill.
6. Identify and demonstrate ability to use power plane.
7. Identify and demonstrate ability to use routers.
8. Identify and demonstrate ability to use sanders.
9. Identify and demonstrate ability to use motorized miter saw.
10. Identify and demonstrate ability to use air driven nailers and staplers.
11. Identify and demonstrate ability to use powder actuated driver.
12. Identify and demonstrate ability to use table saw.
13. Identify and demonstrate ability to use radial arm saw.
14. Identify and demonstrate ability to use jointer.
15. Identify and demonstrate ability to use band saw.
16. Identify and demonstrate ability to use bench grinder.

UNIT V: Carpenter's Mathematics

Competencies:

1. Add, subtract, multiply and divide whole numbers.
2. Add, subtract, multiply and divide common fractions.
3. Add, subtract, multiply and divide decimal fractions.
4. Calculate areas.
5. Calculate volumes.
6. Calculate weights.
7. Calculate costs.
8. Calculate board feet.

UNIT VI: Blueprint Reading and Sketching

Competencies:

1. Read and use an architect's scale.
2. Identify architect symbols.
3. Read and interpret a set of plans and specifications.
4. Sketch a floor plan.

UNIT VII: Foundations and Formwork

Competencies:

1. Use a builder's level, transit, or laser level.
2. Locate a building and erect batter boards.
3. Construct a section of a continuous wall form.

4. Construct and set forms for a pier footing.
5. Construct monolithic floor form with vapor barrier.
6. Dismantle forms and prepare for storage.

UNIT VIII: Floor and Wall Framing

Competencies:

1. Identify types of framing.
2. Build and install sills and floor joists with a floor opening.
3. Install solid and cross bridging.
4. Identify types of and install subflooring.
5. Estimate materials and cost for floor and wall framing.
6. Identify safe uses for ladders and scaffolding.
7. Install sole plates and cut top plates.
8. Determine wall rough openings.
9. Lay out wall locations, rough openings and stud locations.
10. Build corner studs and partition T's.
11. Build door and window bucks.
12. Install double top plate and raise walls.
13. Brace corners and align walls.
14. Install wall sheathing.
15. Erect a metal stud wall with gypsum board.

UNIT IX: Ceiling and Roof Framing

Competencies:

1. Lay out ceiling joists and rafter locations.
2. Cut and install ceiling joists with ceiling openings.
3. Cut and install strong backs.
4. Identify roof styles.
5. Lay out, cut, and erect common rafters and ridge boards for a gable roof with roof opening.
6. Frame a gable end with vent opening and barge rafters.
7. Lay out, cut, and install collar beams and roof braces.
8. Install facia box cornice.
9. Install roof sheathing, felt, and eave edging.
10. Install composition roofing.
11. Lay out, cut and erect hip and valley rafters and ridge board for an intersecting hip roof.
12. Lay out, cut, and erect hip and valley jack rafters.
13. Lay out, cut and erect cripple jack rafters.
14. Estimate materials and cost for ceiling and roof framing.
15. Identify common roof truss types.
16. Construct a "W" truss.

UNIT X: Exterior Finish

Competencies:

1. Install doors and windows.
2. Install horizontal and vertical siding.
3. Install exterior trim.
4. Estimate materials and cost for exterior finish.

UNIT XI: Interior Finish

Competencies:

1. Install wall and ceiling insulation.
2. Install ceiling furring strips.
3. Install ceiling tile and gypsum wall board.
4. Install prefinished paneling.
5. Install interior doors and hardware.

6. Cut and install door and window trim.
7. Install interior molding.
8. Install floor underlayment.
9. Identify types of stairs.
10. Construct a section of stairs.
11. Estimate materials and cost for interior finish.
12. Install a suspended-type ceiling.

UNIT XII: Cabinetmaking

Competencies:
1. Identify common cabinetmaking joints.
2. Construct a ceiling furr down.
3. Build and install kitchen base cabinet.
4. Build and install kitchen wall cabinet.
5. Apply plastic laminate countertop to base cabinet.
6. Estimate materials and cost for cabinets.

UNIT XIII: Job Seeking Skills

Competencies:
1. Prepare a personal resume'.
2. Fill out a job application.
3. Prepare a letter of application.
4. Prepare a follow-up letter.
5. Participate in a mock job interview.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Trade and Industrial **Course Title:** Commercial Art

CIP Code: 48.0203 **Course Length** 2700 Clock Hours - 24 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical shop experience to prepare students for employment in the field of Commercial Art or to provide supplemental training for persons previously or currently employed in Commercial Art.

The course prepares individuals to design and execute layouts and make illustrations for advertising displays and instructional manuals. It includes instruction in the preparation of copy; lettering; poster, package, and product design; fashion illustration; silk screening; air brushing; and inks and color dynamics.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The course content is organized into competency-based units of instruction that specify occupational competencies which the student must successfully complete.

Units of Instruction:
I. Introduction to Commercial Art
II. Mathematics
III. Communication Skills
IV. Advertising Mediums
V. Color
VI. Illustration
VII. Basic Design
VIII. Typing
IX. Typography
X. Computer Graphics
XI. Layout and Display Design
XII. Photography
XIII. Process Camera
XIV. Substrate and Ink Fundamentals
XV. Screen Printing
XVI. Offset Lithography
XVII. Employment Preparation

Curriculum Competency Outline

UNIT I: Introduction to Commercial Art

Competencies:
1. Identify the job market.
2. Explain/define basic terminology.
3. Identify and demonstrate proper use of basic tools as found on supply list.
4. Demonstrate a knowledge of basic safety rules.
5. Demonstrate understanding of basic drawing skills.
6. Establish a portfolio.

7. Establish a reference morgue (library including clip-art, photographs, magazines, etc.).

UNIT II: Mathematics

Competencies:

1. Demonstrate ability to add, subtract, multiply and divide whole numbers.
2. Demonstrate ability to add, subtract, multiply and divide fractions.
3. Demonstrate ability to add, subtract, multiply and divide decimals.
4. Demonstrate ability to use the proportional scale.
5. Demonstrate knowledge of terms associated with the line gauge.
6. Demonstrate ability to use the line gauge.
7. Demonstrate understanding of basic geometric design.

UNIT III: Communication Skills

Competencies:

1. Demonstrate knowledge and ability to use basic grammar including: parts of speech, complete sentences, proper punctuation, and proper spelling.
2. Exhibit ability to write creative and motivating copy.
3. Exhibit ability to communicate orally.
4. Identify essential elements of an advertisement.

UNIT IV: Advertising Mediums

Competencies:

1. Define advertising.
2. Identify mediums of advertisement including print (newspaper, magazine, direct mail, etc.), outdoor advertisement, and television.
3. Identify elements of a good advertisement.

UNIT V: Color

Competencies:

1. Demonstrate ability to paint a value scale (gray scale).
2. Demonstrate an understanding of color/light and its properties (including color wheel).
3. Demonstrate basic understanding of color interaction.
4. Demonstrate understanding of the psychology of color.

UNIT VI: Illustration

Competencies:

1. Define illustration.
2. Utilize basic materials and tools including: graphite, pen and ink (scratchboard), brush and ink, fluorographics, charcoals, water colors, gouache, prisma colors, acrylics, and air brush.
3. Demonstrate skill in drawing the following: inanimate objects, landscapes, human figure/anatomy, fashion illustration, caricatures, and animals.
4. Demonstrate understanding of perspective.
5. Demonstrate understanding of basic elements of drawing (light, value, mass, form, etc.).

UNIT VII: Basic Design

Competency: Demonstrate ability to utilize the elements and principles of design.

UNIT VIII: Typing

Competency: Demonstrate basic ability to operate a keyboard.

UNIT IX: Typography

Competencies:
1. Identify parts of a typeface.
2. Identify typeface classifications.
3. Identify printers' measurement system.
4. Identify methods of setting type.
5. Demonstrate ability to set type utilizing photographic methods.
6. Demonstrate ability to spec type within half a point.
7. Demonstrate knowledge of calligraphy.

UNIT X: Computer Graphics

Competencies:
1. Identify functions of a graphics computer.
2. Input, store, and retrieve a computer graphics generated job.

UNIT XI: Layout and Display Design

Competencies:
1. Demonstrate understanding of the elements of the layout for an advertisement.
2. Demonstrate ability to produce a layout utilizing the design elements.
3. Prepare a single-color mechanical for reproduction in register (complete campaign including logo, stationery package, brochures, large-scale jobs, three-dimensional mock-ups, etc.).
4. Prepare a multicolor mechanical for reproduction in register (complete campaign including logo, stationery package, brochure, large-scale jobs, three-dimensional mock-ups, tec.).
5. Demonstrate proper techniques in handling a mechanical.
6. Demonstrate ability to proof, including interpreting proof to customer and writing instructions to printer.
7. Build a three-dimensional mock-up.

UNIT XII: Photography

Competencies:
1. Identify types and uses of various cameras, films, lenses, shutter speeds, paper, chemicals, and light sources.
2. Demonstrate ability to shoot a roll of film.
3. Demonstrate an understanding of darkroom safety.
4. Develop film and prints using various darkroom techniques and processes.
5. Prepare print for display: (a) mount a print and (b) mat a print.
6. Identify qualities of a good photograph.
7. Plan, develop, and produce a video tape.

UNIT XIII: Process Camera

Competencies:
1. Identify darkroom equipment, materials, and procedures including parts of and purposes of process cameras.
2. Use a process camera in shooting a live negative/positive, half-tone, stat, film positive/negative, and veloxes.
3. Identify special effects screens.
4. Identify and incorporate safety rules applied to the use of the process camera.

UNIT XIV: Substrate and Ink Fundamentals

Competency: Identify and utilize appropriate substrates and compatible inks.

UNIT XV: Screen Printing

Competencies:

1. Identify basic tools and equipment.
2. Incorporate safety rules in printing.
3. Prepare screen.
4. Utilize hand-cut stencil methods.
5. Produce screen utilizing screen-filler method or tusche glue method.
6. Demonstrate use of direct and indirect photographic emulsion.
7. Make ready and print single-color job in register.
8. Make ready and print multicolor job in register.
9. Print single-color work on textiles in register.
10. Print multicolor work on textiles in register.
11. Demonstrate clean-up procedures.

UNIT XVI: Offset Lithography

Competencies:

1. Identify equipment.
2. Identify and apply safety procedures.
3. Demonstrate the ability to strip and burn plates.
4. Demonstrate the ability to run single and multicolor offset work in register.
5. Demonstrate the ability to bind and finish offset work.
6. Demonstrate clean-up procedures.

UNIT XVII:: Employment Preparation

Competencies:

1. Demonstrate an understanding of the current job market.
2. Update portfolio.
3. Prepare a personal resume' and letter of introduction.
4. Fill out a job application.
5. Participate in a mock job interview.
6. Prepare a follow-up letter.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Trade and Industrial **Course Title:** Communications Electronics

CIP Code: 47.0103 **Course Length** 2700 Clock Hours - 24 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical shop experience to prepare students for employment in a variety of jobs in the field of Communications Electronics or to provide supplemental training for persons previously or currently employed in related Communications Electronics occupations.

The course generally prepares individuals to assemble, install, operate, maintain, and repair one- and two-way communications equipment and systems, including amplitude modulated (AM) and frequency modulated (FM) radio, television, hearing aids, and other electronic communication devices or systems. Includes instruction in using actual equipment or educational trainers in various types of equipment, motors, mechanical devices, power supplies, amplifiers, and digital circuitry; reading and interpretation of electrical diagrams/schematics; radar; fiber optics; laser techniques; computer applications; telecommunications; microwave; diagnostic and troubleshooting techniques; the use of testing equipment; Federal Communications Commission (FCC) and Federal Aviation Authority (FAA) licensing requirements.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The content is organized into competency-based units of instruction which specify occupational competencies which the student must successfully complete.

Units of Instruction:

FIRST YEAR
I. Fundamentals of Electricity/Electronics
II. Mathematics
III. Physics
IV. Fundamentals of Semiconductors
V. Basic Electronic Circuits
VI. Digital Electronics
VII. Basic Microprocessors
VIII. Computer Literacy

SECOND YEAR
IX. Introduction to Communications Servicing
X. Two-Way Communications
XI. Microwave
XII. Radar
XIII. Antenna Systems
XIV. Uninterruptible Power Supply (UPS)
XV. Test Equipment
XVI. Computer Applications
XVII. Troubleshooting Techniques
XVIII. Systems
XIX. Telecommunications
XX. Installation Techniques
XXI. Business Practices
XXII. Customer Service and Human Relations
XXIII. Job Seeking Skills

FIRST YEAR

UNIT I: Fundamentals of Electricity/Electronics

Competencies:
1. Demonstrate a knowledge of occupational job requirements, working conditions, safety hazards, pay scales, and career opportunities.
2. Identify safety hazards.
3. Demonstrate a knowledge of common safety rules and regulations.
4. Identify hand tools.
5. Demonstrate proper techniques and use of hand tools.
6. Apply correct soldering techniques.
7. Identify electrical/electronic test instruments.
8. Perform measurements using electrical/electronic test instruments.
9. Identify terms associated with electricity/electronics.
10. Identify electrical/electronic symbols.
11. Identify electrical/electronic formulas.
12. Identify electrical/electronic components.
13. Display a knowledge of atomic theory.
14. Demonstrate a knowledge of theory of ac and dc current flow.
15. Solve problems using the basic laws governing electron flow.
16. Connect electrical/electronic components in specified circuit configuration.
17. Apply safety practices.

UNIT II: Mathematics

Competencies:
1. Solve problems dealing with fractions, percentages, ratio and proportion, and powers of ten.
2. Solve problems of plane and solid geometry.
3. Solve problems using algebraic formulas.
4. Solve problems using logarithms.
5. Apply the principles in trigonometry in solving problems.
6. Solve problems using a scientific electronic calculator.

UNIT III: Physics

Competencies:
1. State the properties of matter.
2. Demonstrate the applications and effects of force, work, rate, momentum, resistance, power, potential and kinetic energy, force transformers, energy converters, transducers, vibration and waves, time constants, and radiation using mechanical energy systems.
3. Demonstrate the applications and effects of force, work, rate, momentum, resistance, power, potential and kinetic energy, force transformers, energy converters, transducers, vibration and waves, time constants, and radiation using fluidal energy systems.
4. Demonstrate the applications and effects of force, rate, resistance, power, potential and kinetic energy, force transformers, energy converters, transducers, vibration and waves, time constants, and radiation using electrical energy systems.
5. Demonstrate the applications and effects of force, work, rate, resistance, power, potential and kinetic energy, energy converters, transducers, time constants, and radiation using thermal energy systems.

UNIT IV: Fundamentals of Semiconductors

Competencies:

1. Identify terms associated with semiconductors.
2. Identify semiconductor symbols.
3. Identify semiconductor components.
4. Describe the characteristics of semiconductors.
5. Test various semiconductor devices.
6. Interpret semiconductor specification sheets.
7. Demonstrate the procedures for testing and servicing semiconductors.
8. Identify safety hazards associated with semiconductor devices.
9. Apply safety practices.

UNIT V: Basic Electronic Circuits

Competencies:

1. Identify terms associated with power supplies, amplifiers, and oscillators.
2. Identify schematic representations of power supplies, amplifiers, and oscillator circuits.
3. State the theory of operation of power supply circuits, amplifier circuits and oscillator circuits.
4. Construct and analyze various power supply circuits, amplifier circuits, and oscillator circuits.
5. Identify safety practices associated with basic electronic circuits.
6. Apply safety practices.

UNIT VI: Digital Electronics

Competencies:

1. Identify logic gate configuration.
2. Describe the truth tables associated with various logic circuits.
3. Simplify logic circuits using specified techniques.
4. Interpret integrated circuit specification sheets.
5. Identify registers, counters, multivibrators (bistable, monostable, etc.) and display devices.
6. Describe digital-to-analog and analog-to-digital techniques.
7. Analyze digital arithmetic circuits.
8. Identify safety hazards associated with digital circuits.
9. Apply safety practices.

UNIT VII: Basic Microprocessors

Competencies:

1. Identify terms associated with microprocessors.
2. Describe the basic architecture of a microprocessor.
3. Describe the basic operation of a microprocessor.
4. Demonstrate a fundamental knowledge of assembly language programming.
5. Describe system interfacing circuits and techniques.

UNIT VIII: Computer Literacy

Competencies:

1. Identify terms associated with computers.
2. Identify the impact of computers on today's society.
3. Demonstrate ability to select hardware and software components.

SECOND YEAR

UNIT IX: Introduction to Communications Servicing

Competencies:

1. Identify terms associated with the communications industry.
2. Demonstrate a knowledge of job requirements.
3. Identify safety hazards associated with the communications industry.
4. Demonstrate a knowledge of career opportunities.
5. Describe the history of the communications industry.
6. Identify the various types of communications systems.
7. Identify the applications of the various types of communications systems.
8. Demonstrate a knowledge of the various trade publications available to the technician.
9. Demonstrate a knowledge of the various trade/professional organizations available to the technician.
10. Demonstrate a knowledge of the various code/licensing requirements in the communications industry.

UNIT X: Two-Way Communications

Competencies:

1. Identify terms associated with two-way communications.
2. Identify the various types of two-way communications systems.
3. Identify the various components used in a two-way communications system.
4. Describe the function of the various components found in a two-way communications system.
5. Align and tune a two-way communications transceiver.
6. Identify peripheral equipment.
7. Describe the applications of the various types of peripheral equipment.
8. Identify safety hazards associated with servicing two-way communications equipment.
9. Apply safety practices.
10. Demonstrate a knowledge of Federal Communications Commission (FCC)/Federal Aviation Authority (FAA) certification requirements in servicing two-way communications systems.
11. Maintain FCC/FAA maintenance logs.
12. Obtain communications certification/license from government/industry agency.

UNIT XI: Microwave

Competencies:

1. Identify terms associated with microwave systems.
2. Identify the various components of a microwave system.
3. Describe the function of the various components of a microwave system.
4. Describe the operation of a microwave system.
5. Identify the factors that affect the design requirements of a microwave system.
6. Perform the installation and adjustment of a channel to manufacturer's specifications.
7. Identify safety hazards associated with microwave servicing.
8. Apply safety practices.

UNIT XII: Radar

Competencies:

1. Identify terms associated with radar systems.
2. Describe the various applications of radar systems.
3. Identify the various components of a radar system.
4. Describe the functions of the various components of a radar system.
5. Describe the effects of radar systems upon other electronic systems.
6. Identify the factors that affect radar system operations.
7. Interpret display presentations.
8. Demonstrate a knowledge of FCC/FAA certification requirements in servicing radar systems.
9. Maintain FCC/FAA maintenance logs.
10. Identify safety hazards associated with servicing radar systems.
11. Apply safety practices.

UNIT XIII: Antenna Systems

Competencies:
1. Identify terms associated with antennas.
2. Identify various types of antennas.
3. Demonstrate a knowledge of antenna systems.
4. Identify safety hazards associated with servicing antenna systems.
5. Apply safety practices.

UNIT XIV: Uninterruptible Power Supply (UPS)

Competencies:
1. Identify terms associated with uninterruptible power supply.
2. Identify the various types of uninterruptible power supply systems.
3. Describe the applications of the various uninterruptible power supply systems.
4. Calculate uninterruptible power supply capacity.
5. Perform preventive maintenance.
6. Troubleshoot uninterruptible power supply systems.
7. Repair/replace defective components.
8. Identify safety hazards associated with servicing uninterruptible power supply systems.
9. Apply safety practices.

UNIT XV: Test Equipment

Competencies:
1. Identify terms associated with test equipment.
2. Identify various types of test equipment.
3. Describe the function of various types of test equipment.
4. Describe the operation of various types of test equipment.
5. Perform equipment verification.
6. Perform electrical measurements using test equipment.
7. Perform equipment care and maintenance techniques.
8. Identify safety hazards associated with test equipment use.
9. Apply safety practices.

UNIT XVI: Computer Applications

Competencies:
1. Identify terms associated with computer application of communications systems.
2. Identify the various computer applications found in communications systems.
3. Identify the various components that make up a computer application in a communications system.
4. Load a system.
5. Demonstrate the use of an operating system.
6. Demonstrate the use of operating system utilities.
7. Identify safety hazards associated with computer applications to communications systems.
8. Troubleshoot computer applications to communications systems.
9. Adjust and repair/replace defective components.
10. Apply safety practices.

UNIT XVII: Troubleshooting Techniques

Competencies:
1. Identify terms associated with troubleshooting techniques.
2. Demonstrate a knowledge of troubleshooting techniques.
3. Evaluate customer complaints.
4. Observe system operation.
5. Implement logical troubleshooting techniques.
6. Formulate a plan.
7. Read and interpret schematics.
8. Perform operational check.

9. Document service procedures taken.
10. Identify safety hazards associated with troubleshooting.
11. Apply safety practices.

UNIT XVIII: Systems

Competencies:

1. Identify terms associated with communications systems.
2. Identify the various types of communications systems.
3. Describe the operation of various types of communications systems.
4. Draw a block diagram of various types of communications systems.
5. Describe the function of the various sections identified on a block diagram of a communications system.
6. Identify the safety hazards associated with communications systems.
7. Apply safety practices.
8. Identify environmental factors associated with the operation of various communications systems.
9. Determine signal levels using decibel levels as a reference point.

UNIT XIX: Telecommunications

Competencies:

1. Identify terms associated with telecommunications systems.
2. Identify the various types of telecommunications systems.
3. Identify the components of the various types of telecommunications systems.
4. Describe various types of telephone circuits.
5. Describe the various applications of telephone interface devices/modems and conditioners.
6. Identify the applications of fiber optics in the communications industry.
7. Identify the functions of the various components of telecommunications systems.
8. Demonstrate a knowledge of cellular system operations.
9. Identify safety hazards associated with telecommunications servicing.
10. Apply safety practices.
11. Describe the principles of data/voice security practices.

UNIT XX: Installation Techniques

Competencies:

1. Identify terms associated with installation of equipment.
2. Demonstrate a knowledge of power conditioning.
3. Demonstrate a knowledge of uninterruptible power supply systems.
4. Demonstrate a knowledge of grounding requirements and techniques.
5. Demonstrate the ability to install cables and related components.
6. Identify the various installation tools used by the industry.
7. Demonstrate a knowledge of site selection, equipment layout, and installation requirements.
8. Demonstrate the ability to perform drafting and sketching techniques.
9. Identify safety hazards associated with installation practices.
10. Apply safety practices.
11. Perform certification of the installation.

UNIT XXI: Business Practices

Competencies:

1. Identify terms associated with business/administrative practices.
2. Prepare service bills.
3. Maintain customer accounts and records.
4. Maintain equipment inventory and parts control.
5. Read and interpret parts/service manuals.

6. Maintain parts/service manual revisions.
7. Execute maintenance contracts and service agreements.
8. Demonstrate a knowledge of the cost factor in doing business.

UNIT XXII: Customer Service and Human Relations

Competencies:
1. Demonstrate the ability to speak effectively.
2. Demonstrate a willingness to learn.
3. Demonstrate a professional attitude.
4. Demonstrate the ability to be a good listener.
5. Demonstrate the ability to follow oral and written instructions.
6. Demonstrate the ability to communicate instructions accurately and effectively.
7. Demonstrate high reliability in the performance of duties.
8. Demonstrate problem-solving skills.
9. Demonstrate punctuality.
10. Exhibit pride and loyalty.
11. Comply with safety and health rules.
12. Demonstrate personal hygiene and cleanliness.
13. Show empathy, respect, and support for others.
14. Write legibly.
15. Practice good telephone etiquette.
16. Demonstrate the ability to write an effective technical report.
17. Demonstrate equipment and software operation.
18. Determine the problem and formulate a plan.
19. Perform the service.
20. Complete the transaction.
21. Maintain trade tools and equipment in optimal condition.
22. Evaluate services performed with the customer.
23. Verify charges.

UNIT XXIII: Job Seeking Skills

Competencies:
1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.
5. Write a letter of application.
6. Complete a job application.
7. Participate in a mock interview.
8. Write a follow-up letter.
9. Conduct a job search.
10. Write a letter of resignation.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Trade and Industrial **Course Title:** Computer Electronics

CIP Code: 47.0104 **Course Length** 2700 Clock Hours - 24 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical shop experience to prepare students for employment in a variety of jobs in the field of Computer Electronics or to provide supplemental training for persons previously or currently employed in related electronics occupations.

The Computer Electronics course generally prepares individuals to install, program, operate, maintain, service, and diagnose operational problems in computer systems arising from mechanical or electrical malfunctions in computer units or systems. Includes instruction in the underlying physical sciences and mathematics, installation, construction, programming, operation, maintenance, and functional diagnosis; and how to detect, isolate, and correct malfunctions. Programs describe the electrical and electronic circuits and mechanical devices used in computer construction and their combination into systems in individual computers or computing installations, as well as instruments used to detect weaknesses or failures in electrical systems in computers.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The content is organized into competency-based units of instruction which specify occupational competencies which the student must successfully complete.

Units of Instruction:

FIRST YEAR
I. Fundamentals of Electricity/Electronics
II. Mathematics
III. Physics
IV. Fundamentals of Semiconductors
V. Basic Electronic Circuits
VI. Digital Electronics
VII. Basic Microprocessors
VIII. Computer Literacy

SECOND YEAR
IX. Introduction to Computer Servicing
X. Computer Systems
XI. Operating Systems
XII. Programming
XIII. Input/Output Devices
XIV. Peripherals
XV. Electro-Optical-Mechanical Systems
XVI. Communications
XVII. Troubleshooting
XVIII. Installation and Maintenance
XIX. Administrative Practices
XX. Customer Service and Human Relations
XXI. Job Seeking Skills

FIRST YEAR

UNIT I: Fundamentals of Electricity/Electronics

Competencies:

1. Demonstrate a knowledge of occupational job requirements, working conditions, safety hazards, pay scales, and career opportunities.
2. Identify safety hazards.
3. Demonstrate a knowledge of common safety rules and regulations.
4. Identify hand tools.
5. Demonstrate proper techniques and use of hand tools.
6. Apply correct soldering techniques.
7. Identify electrical/electronic test instruments.
8. Perform measurements using electrical/electronic test instruments.
9. Identify terms associated with electricity/electronics.
10. Identify electrical/electronic symbols.
11. Identify electrical/electronic formulas.
12. Identify electrical/electronic components.
13. Display a knowledge of atomic theory.
14. Demonstrate a knowledge of theory of ac and dc current flow.
15. Solve problems using the basic laws governing electron flow.
16. Connect electrical/electronic components in specified circuit configuration.
17. Apply safety practices.

UNIT II: Mathematics

Competencies:

1. Solve problems dealing with fractions, percentages, ratio and proportion, and powers of ten.
2. Solve problems of plane and solid geometry.
3. Solve problems using algebraic formulas.
4. Solve problems using logarithms.
5. Apply the principles in trigonometry in solving problems.
6. Solve problems using a scientific electronic calculator.

UNIT III: Physics

Competencies:

1. State the properties of matter.
2. Demonstrate the applications and effects of force, work, rate, momentum, resistance, power, potential and kinetic energy, force transformers, energy converters, transducers, vibration and waves, time constants, and radiation using mechanical energy systems.
3. Demonstrate the applications and effects of force, work, rate, momentum, resistance, power, potential and kinetic energy, force transformers, energy converters, transducers, vibration and waves, time constants, and radiation using fluidal energy systems.
4. Demonstrate the applications and effects of force, rate, resistance, power, potential and kinetic energy, force transformers, energy converters, transducers, vibration and waves, time constants, and radiation using electrical energy systems.
5. Demonstrate the applications and effects of force, work, rate, resistance, power, potential and kinetic energy, energy converters, transducers, time constants, and radiation using thermal energy systems.

UNIT IV: Fundamentals of Semiconductors

Competencies:

1. Identify terms associated with semiconductors.
2. Identify semiconductor symbols.
3. Identify semiconductor components.
4. Describe the characteristics of semiconductors.
5. Test various semiconductor devices.
6. Interpret semiconductor specification sheets.
7. Demonstrate the procedures for testing and servicing semiconductors.
8. Identify safety hazards associated with semiconductor devices.
9. Apply safety practices.

UNIT V: Basic Electronic Circuits

Competencies:

1. Identify terms associated with power supplies, amplifiers, and oscillators.
2. Identify schematic representations of power supplies, amplifiers, and oscillator circuits.
3. State the theory of operation of power supply circuits, amplifier circuits and oscillator circuits.
4. Construct and analyze various power supply circuits, amplifier circuits, and oscillator circuits.
5. Identify safety practices associated with basic electronic circuits.
6. Apply safety practices.

UNIT VI: Digital Electronics

Competencies:

1. Identify logic gate configuration.
2. Describe the truth tables associated with various logic circuits.
3. Simplify logic circuits using specified techniques.
4. Interpret integrated circuit specification sheets.
5. Identify registers, counters, multivibrators (bistable, monostable, etc.) and display devices.
6. Describe digital-to-analog and analog-to-digital techniques.
7. Analyze digital arithmetic circuits.
8. Identify safety hazards associated with digital circuits.
9. Apply safety practices.

UNIT VII: Basic Microprocessors

Competencies:

1. Identify terms associated with microprocessors.
2. Describe the basic architecture of a microprocessor.
3. Describe the basic operation of a microprocessor.
4. Demonstrate a fundamental knowledge of assembly language programming.
5. Describe system interfacing circuits and techniques.

UNIT VIII: Computer Literacy

Competencies:

1. Identify terms associated with computers.
2. Identify the impact of computers on today's society.
3. Demonstrate ability to select hardware and software components.

SECOND YEAR

UNIT IX: Introduction to Computer Servicing

Competencies:
1. Identify terms associated with computer systems.
2. Demonstrate an awareness of job requirements.
3. Identify safety hazards associated with the job.
4. Demonstrate an awareness of career opportunities.
5. Describe the history of computers.
6. Identify the different classifications of computers.
7. Identify computer applications.

UNIT X: Computer Systems

Competencies:
1. Identify terms associated with computer systems.
2. Identify the major components of a computer system.
3. Identify the components of computer subsystems.
4. Analyze system/microprocessor architecture.
5. Write and execute machine level programs for system analysis.
6. Demonstrate system data flow and logic analysis.

UNIT XI: Operating Systems

Competencies:
1. Identify terms associated with operating systems.
2. Identify the various types of operating systems.
3. Load an operating system.
4. Demonstrate the use of an operating system.
5. Demonstrate the use of operating system utilities.

UNIT XII: Programming

Competencies:
1. Identify terms associated with programming.
2. Identify programming languages.
3. Write a pseudo-code program.
4. Write a program using the five fundamental programming structures.
5. Implement the program using a high-level language.

UNIT XIII: Input/Output (I/O) Devices

Competencies:
1. Identify terms associated with input/output (I/O) devices.
2. Demonstrate a knowledge of system busses.
3. Use peripheral interface adapters (PIA) to perform input/output operations.
4. Use asynchronous communications interface adapters (ACIA) to perform input/output operations.
5. Demonstrate the interfacing of memory to the system buss.

UNIT XIV: Peripherals

Competencies:
1. Identify terms associated with peripherals.
2. Identify information interchange coding.
3. Identify various types of video displays.
4. Explain the use and operation of various types of video displays.
5. Identify the various types of printing devices.
6. Explain the use and operation of various types of printing devices.
7. Identify the various types of input devices.
8. Explain the use and operation of various input devices.
9. Identify the various types of data storage devices.

10. Explain the use and operation of various types of data storage devices.
11. Demonstrate the use of serial RS-232 interface configurations.
12. Demonstrate the use of parallel-centronics interface configurations.
13. Fabricate interface cable and connectors.

UNIT XV: Electro-Optical-Mechanical Systems

Competencies:

1. Identify terms associated with electro-mechanical systems.
2. Describe the operation of various types of motors and servo-mechanisms.
3. Demonstrate a knowledge of linkages, cams, gears, and clutches.
4. Identify safety hazards associated with electro-mechanical systems.
5. Apply safety practices associated with electro-mechanical systems.
6. Demonstrate the use of an electro-mechanical device.
7. Identify terms associated with electro-optical systems.
8. Describe the operation of various types of fiber optic systems.
9. Describe the operation of various types of light amplification by simulated emission of radiation (laser) systems.
10. Identify safety hazards associated with fiber optic and laser systems.
11. Apply safety practices associated with fiber optic and laser systems.
12. Demonstrate the use of an electro-optical system.

UNIT XVI: Communications

Competencies:

1. Identify terms associated with computer communications.
2. Describe modes of data transmissions.
3. Describe the operation of modems and multiplexers/demultiplexers.
4. Describe communications protocol and software applications.
5. Use communications protocol and software.
6. Demonstrate a knowledge of Local Area Networks (LAN).

UNIT XVII: Troubleshooting

Competencies:

1. Identify terms associated with troubleshooting.
2. Demonstrate a knowledge of troubleshooting techniques.
3. Execute systems diagnostics.
4. Perform service procedures.
5. Identify safety hazards associated with troubleshooting practices.
6. Apply safety practices associated with troubleshooting practices.

UNIT XVIII: Installation and Maintenance

Competencies:

1. Identify terms associated with computer installation and maintenance.
2. Demonstrate a knowledge of power conditioning.
3. Demonstrate a knowledge of uninterruptible power supply (UPS).
4. Demonstrate a knowledge of environmental conditioning.
5. Perform preventive maintenance (PM) procedure on a computer system.
6. Demonstrate a knowledge of site selection, equipment layout, and installation requirements.
7. Identify safety hazards associated with installation and maintenance practices.
8. Apply safety practices associated with installation and maintenance.
9. Perform post-maintenance equipment evaluation.

UNIT XIX: Administrative Practices

Competencies:

1. Identify terms associated with administrative practices.
2. Prepare service bills.

3. Maintain customer accounts and records.
4. Maintain equipment inventory and parts control.
5. Read and interpret parts and service manuals.
6. Maintain parts and service manual revisions.
7. Execute maintenance contracts and service agreements.

UNIT XX: Customer Service and Human Relations

Competencies:
1. Demonstrate the ability to speak effectively.
2. Demonstrate a willingness to learn.
3. Demonstrate a professional attitude.
4. Demonstrate the ability to be a good listener.
5. Demonstrate the ability to follow oral and written instructions.
6. Demonstrate the ability to communicate instructions accurately and effectively.
7. Demonstrate high reliability in the performance of duties.
8. Demonstrate problem-solving skills.
9. Demonstrate punctuality.
10. Exhibit pride and loyalty.
11. Comply with safety and health rules.
12. Demonstrate personal hygiene and cleanliness.
13. Show empathy, respect, and support for others.
14. Write legibly.
15. Practice good telephone etiquette.
16. Demonstrate the ability to write an effective technical report.
17. Demonstrate equipment and software operation.
18. Determine the problem and formulate a plan.
19. Perform the service.
20. Complete the transaction.

UNIT XXI: Job Seeking Skills

Competencies:
1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.
5. Write a letter of application.
6. Complete a job application.
7. Participate in a mock interview.
8. Write a follow-up letter.
9. Conduct a job search.
10. Write a letter of resignation.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Trade and Industrial **Course Title:** Consumer Electronics Technician

CIP Code: 47.0199 **Course Length** 2700 Clock Hours - 24 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical shop experience to prepare students for employment in a variety of jobs in the field of Consumer Electronics or to provide supplemental training for persons previously or currently employed in related Consumer Electronics occupations.

The Consumer Electronics course generally prepares individuals to install, program, operate, maintain, service, and diagnose operational problems in consumer electronics products arising from mechanical or electrical malfunctions. Includes instruction in the underlying physical sciences, supporting mathematics and electrical theory; diagnostic procedures and techniques; reading and interpretation of electrical diagrams/schematics; electrical/electronic circuits and mechanical devices used in consumer electronics products; and instruments used to detect weakness or failures in electrical systems.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The content is organized into competency-based units of instruction which specify occupational competencies which the student must successfully complete.

Units of Instruction:

FIRST YEAR

I. Fundamentals of Electricity/Electronics
II. Mathematics
III. Physics
IV. Fundamentals of Semiconductors
V. Basic Electronic Circuits
VI. Digital Electronics
VII. Basic Microprocessors
VIII. Computer Literacy

SECOND YEAR

IX. Introduction to Consumer Electronics
X. Audio, Paging/Intercom Systems
XI. Radio
XII. Television
XIII. Motors and Servomechanisms
XIV. Video Cassette Recorders and Video Cameras
XV. Compact Discs
XVI. Security Systems and Closed Circuit Television
XVII. Microwave and Convection Ovens
XVIII. Satellite Systems
XIX. Customer Relations and Communications Skills
XX. Business Practices
XXI. Job Seeking Skills

Curriculum Competency Outline

FIRST YEAR

UNIT I: Fundamentals of Electricity/Electronics

Competencies:

1. Demonstrate a knowledge of occupational job requirements, working conditions, safety hazards, pay scales, and career opportunities.
2. Identify safety hazards.
3. Demonstrate a knowledge of common safety rules and regulations.
4. Identify hand tools.
5. Demonstrate proper techniques and use of hand tools.
6. Apply correct soldering techniques.
7. Identify electrical/electronic test instruments.
8. Perform measurements using electrical/electronic test instruments.
9. Identify terms associated with electricity/electronics.
10. Identify electrical/electronic symbols.
11. Identify electrical/electronic formulas.
12. Identify electrical/electronic components.
13. Display a knowledge of atomic theory.
14. Demonstrate a knowledge of theory of ac and dc current flow.
15. Solve problems using the basic laws governing electron flow.
16. Connect electrical/electronic components in specified circuit configuration.
17. Apply safety practices.

UNIT II: Mathematics

Competencies:

1. Solve problems dealing with fractions, percentages, ratio and proportion, and powers of ten.
2. Solve problems of plane and solid geometry.
3. Solve problems using algebraic formulas.
4. Solve problems using logarithms.
5. Apply the principles in trigonometry in solving problems.
6. Solve problems using a scientific electronic calculator.

UNIT III: Physics

Competencies:

1. State the properties of matter.
2. Demonstrate the applications and effects of force, work, rate, momentum, resistance, power, potential and kinetic energy, force transformers, energy converters, transducers, vibration and waves, time constants, and radiation using mechanical energy systems.
3. Demonstrate the applications and effects of force, work, rate, momentum, resistance, power, potential and kinetic energy, force transformers, energy converters, transducers, vibration and waves, time constants, and radiation using fluidal energy systems.
4. Demonstrate the applications and effects of force, rate, resistance, power, potential and kinetic energy, force transformers, energy converters, transducers, vibration and waves, time constants, and radiation using electrical energy systems.
5. Demonstrate the applications and effects of force, work, rate, resistance, power, potential and kinetic energy, energy converters, transducers, time constants, and radiation using thermal energy systems.

UNIT IV: Fundamentals of Semiconductors

Competencies:

1. Identify terms associated with semiconductors.
2. Identify semiconductor symbols.
3. Identify semiconductor components.
4. Describe the characteristics of semiconductors.
5. Test various semiconductor devices.
6. Interpret semiconductor specification sheets.
7. Demonstrate the procedures for testing and servicing semiconductors.
8. Identify safety hazards associated with semiconductor devices.
9. Apply safety practices.

UNIT V: Basic Electronic Circuits

Competencies:

1. Identify terms associated with power supplies, amplifiers, and oscillators.
2. Identify schematic representations of power supplies, amplifiers, and oscillator circuits.
3. State the theory of operation of power supply circuits, amplifier circuits and oscillator circuits.
4. Construct and analyze various power supply circuits, amplifier circuits, and oscillator circuits.
5. Identify safety practices associated with basic electronic circuits.
6. Apply safety practices.

UNIT VI: Digital Electronics

Competencies:

1. Identify logic gate configuration.
2. Describe the truth tables associated with various logic circuits.
3. Simplify logic circuits using specified techniques.
4. Interpret integrated circuit specification sheets.
5. Identify registers, counters, multivibrators (bistable, monostable, etc.) and display devices.
6. Describe digital-to-analog and analog-to-digital techniques.
7. Analyze digital arithmetic circuits.
8. Identify safety hazards associated with digital circuits.
9. Apply safety practices.

UNIT VII: Basic Microprocessors

Competencies:

1. Identify terms associated with microprocessors.
2. Describe the basic architecture of a microprocessor.
3. Describe the basic operation of a microprocessor.
4. Demonstrate a fundamental knowledge of assembly language programming.
5. Describe system interfacing circuits and techniques.

UNIT VIII: Computer Literacy

Competencies:

1. Identify terms associated with computers.
2. Identify the impact of computers on today's society.
3. Demonstrate ability to select hardware and software components.

SECOND YEAR

UNIT IX: Introduction to Consumer Electronics

Competencies:

1. Identify terms associated with consumer electronics.
2. Demonstrate a knowledge of job requirements.
3. Demonstrate a knowledge of the working conditions of a consumer electronics technician.
4. Describe the factors that determine the need for consumer electronics technicians.
5. Demonstrate a knowledge of career opportunities.
6. Identify the various types of consumer electronics equipment.
7. Identify the applications of the various types of consumer electronics equipment.
8. Demonstrate a knowledge of codes, standards, and regulations.
9. Identify safety hazards associated with consumer electronics installation and servicing operations.
10. Demonstrate a knowledge of the various trade publications available to the consumer electronics technician.
11. Demonstrate a knowledge of the various trade/professional organizations available to the consumer electronics technician.

UNIT X: Audio, Paging/Intercom Systems

Competencies:

1. Identify terms associated with audio, paging/intercom systems.
2. Identify symbols.
3. Read and interpret schematics.
4. Read and interpret parts/service manuals.
5. Maintain parts/service manuals.
6. Demonstrate a knowledge of the functional parts of an audio system.
7. Describe the operation of audio systems.
8. Demonstrate a knowledge of the functional parts of a paging/intercom system.
9. Describe the operation of paging/intercom systems.
10. Demonstrate a knowledge of the functional parts of a telephone system.
11. Perform systematic troubleshooting techniques.
12. Repair/replace defective components.
13. Evaluate the service task/repair.
14. Identify the importance of documenting services and parts used on a service call.
15. Identify safety hazards associated with audio, paging/intercom systems.
16. Apply safety practices.

UNIT XI: Radio

Competencies:

1. Identify terms associated with radio servicing.
2. Identify the major components of a radio.
3. Describe the function and operation of the major components of a radio.
4. Identify electrical/electronic symbols.
5. Draw a block diagram.
6. Read and interpret schematics.
7. Read and interpret parts/service manuals.
8. Maintain parts/service manuals.
9. Troubleshoot radio problems.
10. Repair/replace defective components.
11. Evaluate service techniques.
12. Identify safety hazards associated with radio servicing.
13. Apply safety practices.

UNIT XII: Television

Competencies:

1. Identify terms associated with television.
2. Identify the major components of a television receiver.
3. Describe the function and operation of a television receiver.
4. Identify electrical/electronic symbols.
5. Draw a block diagram.
6. Demonstrate a knowledge of regular antenna and distribution cable signal sources.
7. Read and interpret schematics.
8. Read and interpret parts/service manuals.
9. Maintain parts/service manuals.
10. Troubleshoot television problems.
11. Perform tests using specialized test equipment.
12. Repair/replace defective components.
13. Evaluate the service performed.
14. Identify safety hazards associated with television servicing.
15. Apply safety practices.

UNIT XIII: Motors and Servomechanisms

Competencies:

1. Identify terms associated with motors and servomechanisms.
2. Demonstrate a knowledge of the characteristics of direct current motors.
3. Demonstrate a knowledge of the characteristics of various types of alternating current motors.
4. Demonstrate a knowledge of the testing procedures used for various types of motors.
5. Demonstrate a knowledge of systematic troubleshooting procedures to be followed in checking motors.
6. Troubleshoot motor problems.
7. Identify various types of servomechanisms.
8. Describe the characteristics of servomechanisms.
9. Troubleshoot servomechanism problems.
10. Repair and adjust/replace defective components.
11. Identify safety hazards associated with motor and servomechanism servicing.
12. Apply safety practices.

UNIT XIV: Video Cassette Recorders and Video Cameras

Competencies:

1. Identify terms associated with video cassette recorders and video cameras.
2. Identify electrical/electronic symbols.
3. Read and interpret schematics.
4. Read and interpret parts/service manuals.
5. Maintain parts/service manuals.
6. Describe the operation of video cassette recorders.
7. Describe the operation of video cameras.
8. Draw a block diagram of the various systems found in video cassette recorders and video cameras.
9. Demonstrate a knowledge of signal sources.
10. Troubleshoot video cassette recorder and video camera problems.
11. Repair and adjust/replace defective components.
12. Evaluate the service procedures performed.
13. Identify safety hazards associated with video cassette recorder and video camera servicing operations.
14. Apply safety practices.

UNIT XV: Compact Discs

Competencies:

1. Identify terms associated with compact discs.
2. Identify the major components of a compact disc system.
3. Describe the function and components of a compact disc system.
4. Demonstrate a knowledge of the basic principles of lasers.
5. Identify electrical/electronic symbols.
6. Read and interpret schematics.
7. Read and interpret parts/service manuals.
8. Maintain parts/service manuals.
9. Perform systematic troubleshooting techniques.
10. Repair and adjust/replace defective components.
11. Evaluate service procedures performed.
12. Identify safety hazards associated with compact disc servicing.
13. Apply safety practices.

UNIT XVI: Security Systems and Closed Circuit Television

Competencies:

1. Identify terms associated with security systems and closed circuit television systems.
2. Identify various types of security systems.
3. Identify the major components of various types of security systems.
4. Describe the function and operation of various types of security systems.
5. Identify building design factors that affect security system selection and placement.
6. Demonstrate a knowledge of National Electrical Code requirements that affect security system installations.
7. Determine security system layout for a designated installation.
8. Install a security system.
9. Evaluate an installed system.
10. Troubleshoot security system problems.

UNIT XVII: Microwave and Convection Ovens

Competencies:

1. Identify terms associated with microwave ovens and convection ovens.
2. Identify electrical/electronic symbols.
3. Read and interpret schematics.
4. Read and interpret parts/service manuals.
5. Maintain parts/service manuals.
6. Demonstrate a knowledge of the principles of microwave generation and its applications.
7. Demonstrate a knowledge of codes and standards that govern microwave/convection oven service and service equipment.
8. Identify specialized tools and test equipment required for microwave servicing.
9. Identify major components of microwave and convection ovens.
10. Describe the operation of microwave and convection ovens.
11. Troubleshoot microwave and convection oven problems.
12. Repair and adjust/replace defective components.
13. Perform radiation leakage test.
14. Evaluate the job.
15. Identify safety hazards associated with microwave and convection oven servicing.
16. Apply safety practices.

UNIT XVIII: Satellite Systems

Competencies:

1. Identify terms associated with satellite systems.
2. Identify the major components of satellite systems.
3. Describe the function and operation of satellite system components.

4. Identify the various applications of satellite systems.
5. Draw a block diagram.
6. Install a satellite system.
7. Perform satellite alignment.
8. Troubleshoot a satellite system.
9. Repair/replace defective components.
10. Evaluate service procedures performed.
11. Identify safety hazards associated with satellite system installation and repair.
12. Apply safety practices.

UNIT XIX: Customer Service and Human Relations

Competencies:

1. Identify terms associated with human relations.
2. Demonstrate a willingness to learn.
3. Demonstrate a professional attitude.
4. Demonstrate the ability to be a good listener.
5. Demonstrate the ability to follow oral and written instructions.
6. Demonstrate the ability to communicate instructions accurately and effectively.
7. Demonstrate high reliability in the performance of duties.
8. Demonstrate problem-solving skills.
9. Demonstrate punctuality.
10. Exhibit pride and loyalty.
11. Comply with safety and health rules.
12. Demonstrate personal hygiene and cleanliness.
13. Show empathy, respect, and support for others.
14. Write legibly.
15. Demonstrate the ability to overcome objections without offending the customer.
16. Evaluate the service call with the customer.

UNIT XX: Business Practices

Competencies:

1. Identify terms associated with business practices.
2. Demonstrate a knowledge of inventory control and management.
3. Demonstrate a knowledge of the cost factors involved in doing business.
4. Maintain service vehicle inventory.
5. Maintain service vehicles.
6. Maintain tools and test equipment.
7. Demonstrate a knowledge of the effects of productivity in service operations.
8. Demonstrate a knowledge of codes and regulations governing employer and employee relations.
9. Demonstrate a knowledge of local, state, and federal tax requirements for doing business.
10. Demonstrate a knowledge of technician license requirements.
11. Obtain required technician's license from local, state, or federal agencies.
12. Complete job scope forms and documents.

UNIT XXI: Job Seeking Skills

Competencies:

1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.
5. Write a letter of application.
6. Complete a job application.
7. Participate in a mock interview.
8. Write a follow-up letter.
9. Conduct a job search.
10. Write a letter of resignation.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Trade and Industrial

Course Title: Diesel Mechanics

CIP Code: 47.0605

Course Length 1350 Clock Hours - 12 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical shop experience to prepare individuals for employment as job entry-level diesel mechanics. The course prepares the individual to select, safely use, and maintain hand and power tools, jacks, and hoisting equipment. The content includes, but is not limited to, disassembling engines and replacing parts, fuel injection systems, oil and water pumps, electrical systems, steering and suspension systems, brake systems, drive train, and chassis. Instruction also includes the use of technical manuals, preventive maintenance procedures, communication and employability skills, and safe and efficient work practices. The content is organized into competency-based units of instruction which specify occupational competencies the individual must successfully complete.

Units of Instruction:

I. Occupational Introduction
II. Safety
III. Tools and Equipment
IV. Service Literature
V. Engine Metallurgy
VI. Engine Operating Principles
VII. Cooling Systems
VIII. Fuel Systems
IX. Air Intake and Exhaust System
X. Engine Protection Systems
XI. Lubrication Systems
XII. Engine-Driven Accessories
XIII. Drive Train
XIV. Chassis and Suspension System
XV. Brakes
XVI. Electricity
XVII. Hydraulic and Pneumatic Systems
XVIII. Preventive Maintenance
XIX. Oxyacetylene Equipment
XX. Engine Component Removal
XXI. Job Seeking Skills

Curriculum Competency Outline

UNIT I: Occupational Introduction

Competencies:

1. Describe the field of diesel mechanics.
2. Identify working conditions involved with diesel mechanics.
3. Identify job hazards associated with the field of diesel mechanics.
4. List the salary and benefits associated with employment in the diesel mechanics field.

5. Describe job opportunities available for diesel mechanics.
6. Identify initial investment requirements for professional mechanics.
7. Demonstrate a willingness to learn.
8. Write legibly.
9. Prepare written communications.
10. Exhibit dependability.
11. Demonstrate punctuality.
12. Follow rules and regulations.
13. Read and comprehend written communications and information found in technical manuals.
14. Maintain clean and orderly work area.
15. Use technical manuals effectively.
16. Demonstrate personal hygiene and cleanliness.
17. Comply with safety and health rules.
18. Select correct tools and equipment.
19. Utilize equipment correctly.
20. Work productively with others.
21. Exhibit pride and loyalty.
22. Demonstrate problem-solving skills.
23. Show empathy, respect, and support for others.
24. Meet flat-rate requirements.
25. Apply communication skills to good customer relations.

UNIT II: Safety

Competencies:

1. Use proper lifting techniques.
2. Wear safety glasses.
3. Wear personal protective gear.
4. Wear proper clothing.
5. Report accidents.
6. Keep shop and work area clean.
7. Locate and know how to use fire extinguishers.
8. Demonstrate a knowledge of safe operation of oxyfuel equipment.
9. Demonstrate a knowledge of multi-media first aid.
10. Demonstrate a knowledge of results of having an accident.
11. Use and dispose of toxic fluids and chemicals according to safety regulations and hazardous waste requirements.
12. Maintain hand tools.
13. Use hoists, chains and lifting devices.
14. Maintain an organized work area.
15. Follow proper operating procedures for tools and equipment.
16. Demonstrate safe operating procedures while operating motorized equipment.
17. Demonstrate knowledge of the safe operation procedures for a forklift.
18. Use jack stands and blocking procedures.
19. Demonstrate a knowledge of battery safety.
20. Operate a steam cleaner safely.
21. Apply shop and equipment safety rules.

UNIT III: Tools and Equipment

Competencies:

1. Identify basic hand tools.
2. Use hand tools correctly.
3. Demonstrate proper care and use of torque wrenches.
4. Demonstrate proper care and use of air impact wrenches.
5. Operate forklift.

6. Measure parts using standard and metric measurement systems.
7. Measure parts with steel rule.
8. Measure parts using dial indicators.
9. Measure parts using outside micrometers.
10. Measure parts using inside micrometers.
11. Measure parts using depth micrometers.
12. Measure parts using special micrometers.
13. Measure parts using inside and outside calipers.
14. Measure threads.
15. Calibrate precision measuring tools.
16. Clean and store precision measuring tools.

UNIT IV: Service Literature

Competencies:

1. Demonstrate proper use of service manuals.
2. Use service manual for specific equipment maintenance.
3. Use parts manual.
4. Demonstrate a knowledge of ordering parts.
5. Identify terms associated with diesel mechanics.
6. Identify technical and service manual updates.
7. Read and interpret operators' manuals.
8. Follow troubleshooting techniques prescribed in technical service manuals.
9. Prepare engines for storage as prescribed in technical service manuals.

UNIT V: Engine Metallurgy

Competencies:

1. Identify types of metals used in engine construction.
2. Identify types of materials used in engine construction.
3. Demonstrate a knowledge of proper care and maintenance performed on different engine parts because of metal or material composition.
4. Demonstrate a knowledge of proper cleaning techniques required for different types of materials and/or metals.

UNIT VI: Engine Operating Principles

Competencies:

1. Disassemble a diesel engine.
2. Identify the components of a diesel engine.
3. Clean and inspect components for defects.
4. Replace defective components.
5. Measure and evaluate components.
6. Reassemble a diesel engine.
7. Trace cooling system flow through a diesel engine.
8. Trace oil flow through a diesel engine.
9. Trace fuel flow through a diesel engine.
10. Trace air intake and exhaust flow through a diesel engine.

UNIT VII: Cooling Systems

Competencies:

1. Identify the components of a typical cooling system.
2. Check antifreeze with a hydrometer.
3. Check cooling system for inhibitors.
4. Pressure-test cooling system.
5. Flush cooling system.
6. Test, service, and replace thermostat.
7. Remove and replace radiator hoses.
8. Remove and replace belts.

9. Inspect clutch fan for proper operation.
10. Check temperature and pressures throughout cooling system.
11. Use air flow meter.
12. Perform bottle test on cooling system.
13. Check cooling system for oil contamination.
14. Perform cooling system freon sniffer test.
15. Remove and replace radiator.
16. Remove and replace water pump.
17. Take coolant sample for test purposes.

UNIT VIII: Fuel Systems

Competencies:

1. Identify the components of a typical fuel injection system.
2. Perform diesel fuel test using fuel hydrometer.
3. Test injector for popping pressure.
4. Remove, time and install fuel injection pump.
5. Remove and replace fuel injectors.
6. Remove and replace fuel filters.
7. Test fuel flow using fuel flow meter.
8. Check fuel pressure.
9. Check for air in fuel system.
10. Time fuel injectors and set valves.
11. Check high idle and low idle.
12. Set injector rack.
13. Remove and replace fuel transfer pump.
14. Adjust Jacobs engine brake.
15. Remove, cut open fuel filter, and perform visual inspection.
16. Identify fuel-oil classifications and their uses.

UNIT IX: Air Intake and Exhaust System

Competencies:

1. Identify the components of an air intake system.
2. Identify the components of an exhaust system.
3. Remove and replace air cleaner.
4. Perform air inlet restriction test using a manometer.
5. Check air ducts for defects and leaks.
6. Remove and replace blower.
7. Remove and replace turbocharger.
8. Check air box pressure using mercury manometer.
9. Check exhaust back pressure using mercury manometer.
10. Check exhaust temperature using a pyrometer.
11. Check radial and axial play on turbocharger.
12. Check engine valve adjustment.
13. Remove and replace muffler.
14. Remove and replace exhaust manifold.
15. Remove and replace inner cooler.
16. Remove and replace after cooler.
17. Demonstrate a knowledge of the operation of the air shutoff system.
18. Check intake and exhaust rain caps for correct operation.
19. Comply with emergency shutdown procedures for a diesel engine.
20. Demonstrate a knowledge of waste-gate operation.

UNIT X: Engine Protection Systems

Competencies:

1. Identify the components of engine protection systems.
2. Demonstrate a knowledge of the operation of engine protection systems.
3. Remove and replace engine protection systems.

UNIT XI: Lubrication Systems

Competencies:

1. Identify the components of a typical lubrication system.
2. Check oil cooler for leakage using the freon sniffer test.
3. Check engine lubrication system using an external pump source.
4. Check rod and main bearing clearance using plastigage.
5. Roll out and roll in rod and main bearings.
6. Check oil pressure from low idle to high idle.
7. Remove and replace oil pan.
8. Remove and replace oil pump.
9. Check gear backlash in engine oil pump.
10. Remove and replace engine oil cooler.
11. Remove and cut open oil filter for visual inspection.
12. Take oil sample from engine for test purposes.
13. Identify oil classification.
14. Perform engine lube oil test for fuel and/or water dilution.

UNIT XII: Engine-Driven Accessories

Competencies:

1. Identify engine-driven accessories.
2. Remove and replace air conditioner compressor.
3. Remove and replace air compressor.
4. Remove and replace alternator.
5. Remove and replace power steering pump.
6. Remove and replace hydraulic pump (engine-driven).
7. Remove and replace front-mounted power take-off.
8. Remove power generator unit from engine.
9. Remove and replace automatic transmission.
10. Remove and replace manual transmission.

UNIT XIII: Drive Train

Competencies:

1. Identify the components of a typical drive train.
2. Remove and replace universal joints.
3. Check bore and face runout of flywheel housing and flywheel.
4. Remove and replace pilot bearing.
5. Check pilot bearing for wear and defects.
6. Remove and replace clutch and pressure plate assembly.
7. Remove and replace propeller shaft.
8. Remove and replace axle shaft.
9. Remove and replace differential.
10. Remove and replace automatic transmission.
11. Remove and replace manual transmission.
12. Remove and replace hanger bearing.
13. Check drive line angle and end play.
14. Align and time drive line components.
15. Remove and replace flex plate assembly.

UNIT XIV: Chassis and Suspension System

Competencies:

1. Identify the components of a typical chassis and suspension system.
2. Lubricate chassis.
3. Check tire air pressure.
4. Read and interpret abnormal wear on front tires.
5. Remove, repack and replace front wheel bearings.
6. Inspect chassis for wear and defects.
7. Remove and replace shock absorbers.

8. Remove and replace wheel assemblies.
9. Check and replenish transmission and differential fluid levels.
10. Remove and replace diesel fuel tanks without scratching and marring surface.

UNIT XV: Brakes

Competencies:

1. Identify the components of a typical brake system (air and hydraulic).
2. Remove and replace air chamber assembly.
3. Remove and replace air lines and fittings.
4. Remove and replace brake drum.
5. Remove and replace brake linings.

UNIT XVI: Electricity

Competencies:

1. Use volt-ohmmeter.
2. Demonstrate a knowledge of basic electricity.
3. Read and interpret wiring diagrams.
4. Check continuity.
5. Perform battery load test.
6. Perform voltage drop test.
7. Demonstrate a basic knowledge of a starting circuit.
8. Perform amperage draw test on a starter.
9. Remove and replace starter.
10. Remove and replace starter electrical cables.
11. Check starter solenoid for correct operation.
12. Check battery specific gravity.
13. Charge a battery.
14. Perform current test using ammeter.
15. Remove and replace battery.
16. Jump-start a vehicle.
17. Remove and replace lights.
18. Splice wires.
19. Remove and replace dimmer switch.

UNIT XVII: Hydraulic and Pneumatic Systems

Competencies:

1. Demonstrate a knowledge of the operation of a typical hydraulic system.
2. Remove and replace a hydraulic cylinder.
3. Remove and replace hydraulic lines and fittings.
4. Remove and replace hydraulic valves.
5. Remove and replace accumulator.
6. Remove and replace hydraulic system filters.
7. Remove and replace hydraulic starter.
8. Remove and replace pneumatic starter.
9. Remove and replace lube valve for pneumatic starter.
10. Remove and replace starter button.
11. Remove and replace air throttle actuator.
12. Identify types and classifications of hydraulic lines.
13. Identify types and classifications of pneumatic lines.

UNIT XVIII: Preventive Maintenance

Competencies:

1. Change air filters.
2. Change oil and oil filters.
3. Lubricate chassis.
4. Change fuel filters.

5. Service battery.
6. Service battery electrical cables.
7. Inspect and change hoses.
8. Inspect and change V-belts.
9. Check and replenish fluid levels in transmissions and differentials.
10. Cut open and inspect all enclosed filters.
11. Flush cooling system.
12. Maintain preventive maintenance records on all equipment.
13. Inspect brake linings for wear.
14. Check wheels for seal leakage.
15. Inspect equipment for air, oil and fuel leaks.
16. Perform pressure test on cooling system and radiator cap.
17. Roll out and roll in rod and main bearings.
18. Change fuel water separator.

UNIT XIX: Oxyacetylene Equipment

Competencies:
1. Set up and shut down oxyacetylene torch and equipment.
2. Light and adjust flame.
3. Clean and maintain torch tip.
4. Cut metal.
5. Braze-weld.
6. Heat bearings for installation.
7. Heat metal for removal, bending and installation.
8. Select correct tip for job application.

UNIT XX: Engine Component Removal

Competencies:
1. Remove and replace cylinder head.
2. Remove and replace exhaust manifold gaskets.
3. Remove and replace intake manifold gaskets.
4. Remove and replace water pump.
5. Remove and replace oil pan gasket.
6. Remove and replace turbocharger.
7. Remove and replace fuel injection pump.
8. Remove and replace front crankshaft seal.
9. Remove and replace rear crankshaft seal.
10. Remove and replace fan hub.
11. Remove and replace oil cooler assembly.
12. Remove and replace starter.
13. Remove and replace alternator.
14. Remove and replace valve cover gaskets.

NOTE: All above competencies relate to **inframe** maintenance only.

UNIT XXI: Job Seeking Skills

Competencies:
1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.
5. Write a letter of application.
6. Complete a job application.
7. Participate in a mock interview.
8. Write a follow-up letter.
9. Conduct a job search.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Trade and Industrial **Course Title:** Electrician

CIP Code: 46.0302 **Course Length** 1688 Clock Hours - 15 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical shop experience to prepare students for employment in a variety of jobs in the field as basic electricians or to provide supplemental training for persons previously or currently employed in basic electrician occupations.

This course generally prepares individuals to install, operate, maintain, and repair electrically-energized systems such as residential, commercial, and industrial electric-power wiring, and direct current (dc) and alternating current (ac) motors, controls, uninterruptible power supply (UPS), grounding techniques, and electrical distribution panels. Includes instructions on blueprint and schematic reading and interpretation, code applications and requirements, diagnostic procedures, and the use of test equipment.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The content is organized into competency-based units of instruction which specify occupational competencies which the student must successfully complete.

Units of Instruction:

I. Introduction to the Electrical Occupation
II. Safety
III. Human Relations
IV. Tools and Equipment
V. Materials
VI. Math for Electricians
VII. Basic Electricity
VIII. National Electrical Code
IX. Blueprint Reading
X. Conduit Bending
XI. Electrical Equipment
XII. Construction Methods
XIII. Troubleshooting
XIV. Basic Business
XV. Job Seeking Skills

Curriculum Competency Outline

UNIT I: Introduction to the Electrical Occupation

Competencies:

1. Identify terms associated with the electrical occupation.
2. Demonstrate a knowledge of job requirements.
3. Identify safety hazards associated with the electrical occupation.
4. Demonstrate a knowledge of career opportunities.
5. Demonstrate a knowledge of the working conditions of an electrician.
6. Describe the history of the electrical trades.
7. Demonstrate a knowledge of the various trade publications available to the electrical technician.

8. Demonstrate a knowledge of the various trade/professional organizations available to the electrical technician.
9. Demonstrate a knowledge of the various code/licensing requirements in the electrical industry.

UNIT II: Safety

Competencies:

1. Identify terms associated with safety and safety practices.
2. Demonstrate a knowledge of basic first aid practices.
3. Apply emergency procedures.
4. Apply cardiopulmonary resuscitation (CPR) procedures.
5. Identify electrical safety hazards.
6. Identify personal protective gear.
7. Inspect personal protective gear.
8. Use personal protective gear.
9. Identify various types of fire extinguishers.
10. Use fire extinguishers.
11. Identify Occupational Safety and Health Administration (OSHA) regulations and applications.
12. Apply OSHA regulations in the performance of job scope duties.
13. Identify ladder and scaffold safety requirements.
14. Identify pole-top rescue procedures.
15. Identify lock-out and tag-out procedures.
16. Identify excavation and barrier requirements.
17. Apply safety practices.

UNIT III: Human Relations

Competencies:

1. Identify terms associated with human relations.
2. Demonstrate a willingness to learn.
3. Demonstrate a professional attitude.
4. Demonstrate the ability to be a good listener.
5. Demonstrate the ability to follow oral and written instructions.
6. Demonstrate the ability to communicate instructions accurately and effectively.
7. Demonstrate high reliability in the performance of service procedures.
8. Demonstrate problem-solving skills.
9. Demonstrate punctuality.
10. Exhibit pride and loyalty.
11. Comply with safety and health rules.
12. Demonstrate personal hygiene and cleanliness.
13. Show empathy, respect, and support for others.
14. Write legibly.

UNIT IV: Tools and Equipment

Competencies:

1. Identify terms associated with tools and equipment.
2. Identify hand tools used by electricians.
3. Use hand tools.
4. Identify power tools used by electricians.
5. Use power tools.
6. Identify various types of threading equipment.
7. Use hand and power threading equipment.
8. Identify electrical test equipment.
9. Identify various types of scaffolding used by electricians.
10. Identify various types of ladders used by electricians.
11. Identify types of bucket trucks.

12. Identify various types of man-lifts used by electricians.
13. Identify various types of trenchers.
14. Identify various types of tuggers used by electricians.
15. Identify various types of pumps.
16. Inspect tools for defective components.
17. Report defective tools.
18. Identify safety hazards associated with tools and equipment used by electricians.
19. Apply safety practices.

UNIT V: Materials

Competencies:

1. Identify terms associated with materials.
2. Identify types of fasteners.
3. Identify types of support materials.
4. Identify types of cables and conductors.
5. Identify types of fittings.
6. Identify types of conduit and raceways.
7. Identify types of boxes.
8. Identify types of wiring devices.
9. Identify service equipment.
10. Identify types of disconnects.
11. Identify types of overcurrent devices.
12. Identify types of lighting fixtures.
13. Identify types of motor starters.
14. Identify types of enclosures.
15. Identify types of wiring connectors.
16. Identify types of termination connectors.

UNIT VI: Math for Electricians

Competencies:

1. Identify terms associated with mathematics.
2. Solve arithmetic problems.
3. Solve problems using formulas.
4. Determine angles.
5. Identify measurement units.
6. Determine measurements.

UNIT VII: Basic Electricity

Competencies:

1. Identify terms associated with basic electricity.
2. Define Ohm's Law.
3. Use Ohm's Law to solve problems in series, parallel, and combination circuits.
4. Define magnetism.
5. Describe the relationship of magnetism to electrical circuitry.
6. Identify sources and types of electricity.
7. Identify electrical measuring instruments.
8. Perform voltage, current, and resistance measurements.
9. Demonstrate a knowledge of direct current (dc) theory.
10. Demonstrate a knowledge of alternating current (ac) theory.
11. Demonstrate a knowledge of transformer principles.
12. Describe the progression of electrical development and application.
13. Demonstrate a knowledge of semiconductor devices and their applications.
14. Demonstrate a knowledge of fiberoptic devices and their applications.
15. Identify hazards associated with basic electricity.
16. Apply safety practices.

UNIT VIII: National Electrical Code

Competencies:
1. Identify terms associated with the National Electrical Code (NEC).
2. Demonstrate a knowledge of the National Electrical Code.
3. Identify National Electrical Code applications.
4. Interface National Fire Protection Association (NFPA) code requirements with National Electrical Code requirements.
5. Interface National Electrical Code, National Fire Protection Association, and local code requirements.

UNIT IX: Blueprint Reading

Competencies:
1. Identify terms associated with blueprints.
2. Identify electrical/electronic, mechanical, plumbing, and architectural symbols.
3. Read and interpret electrical blueprints.
4. Correlate other prints with electrical blueprints.
5. Demonstrate the ability to make sketches.

UNIT X: Conduit Bending

Competencies:
1. Identify terms associated with conduit.
2. Identify the various types of conduit.
3. Cut conduit to required lengths.
4. Thread conduit using hand and power tools.
5. Bend conduit using hand and power tools.
6. Install conduit.
7. Support conduit using brackets, braces, hangers, and other support gear.
8. Identify safety hazards associated with conduit bending and installation practices.
9. Apply safety practices.

UNIT XI: Electrical Equipment

Competencies:
1. Identify terms associated with electrical equipment.
2. Identify types of switch gear.
3. Identify types of transformers.
4. Identify types of direct current (dc) motors.
5. Identify types of alternating current (ac) motors.
6. Identify types of rectifiers.
7. Identify types of uninterruptible power supply (UPS) equipment.
8. Identify types of emergency power sources.
9. Identify fire pump control center devices.
10. Identify fire stats.
11. Identify fire alarm systems.
12. Identify types of meters and metering equipment.
13. Identify types of instruments.
14. Identify types of lightning protective equipment.
15. Identify ground fault circuit interrupters (GFCIs).
16. Identify ground fault interrupters (GFIs).

UNIT XII: Construction Methods

Competencies:
1. Identify terms associated with electrical construction.
2. Demonstrate a knowledge of residential electrical installations.
3. Calculate and install a service entrance.
4. Install branch circuits.
5. Install lighting circuits.
6. Install small appliance circuits.

7. Install special appliances.
8. Install feeder circuit.
9. Install laundry circuit.
10. Install ground fault circuit interrupter (GFCI) circuit.
11. Install optional load circuit.
12. Demonstrate a knowledge of commercial and industrial electrical installations.
13. Install a service entrance.
14. Install switchgear.
15. Identify source voltage.
16. Install transformers.
17. Install feeder circuits.
18. Install buss ducts.
19. Install cable trays.
20. Install wireways.
21. Install conductors.
22. Install terminators.
23. Install lighting systems.
24. Install emergency lighting systems.
25. Install electrical systems in hazardous locations.
26. Install special electrical systems.
27. Install emergency generators.
28. Install various types of electric motors.
29. Install controls.
30. Perform cad-weld techniques.
31. Install monitoring equipment.
32. Determine the appropriate times to have electrical installations inspected by local and state/national regulatory agencies to meet codes and standards requirements.

UNIT XIII: Troubleshooting

Competencies:

1. Identify terms associated with troubleshooting.
2. Construct control diagrams.
3. Interpret control diagrams.
4. Troubleshoot lighting circuits.
5. Troubleshoot branch circuits.
6. Troubleshoot motor controls.
7. Troubleshoot special systems.
8. Identify safety hazards associated with troubleshooting.
9. Apply safety practices.

UNIT XIV: Basic Business

Competencies:

1. Identify terms associated with basic business.
2. Write a report.
3. Determine quantity take-offs.
4. Schedule work activity.
5. Determine factors that affect the profitability of doing jobs.
6. Review the process and determine the requirements for having electrical installations inspected by a local/state/national regulatory agency.
7. Complete job tickets.
8. Complete maintenance reports.
9. Complete service reports.
10. Receive and inventory deliveries.
11. Complete an accident report.

UNIT XV: Job Seeking Skills

Competencies:

1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.
5. Write a letter of application.
6. Complete a job application.
7. Participate in a mock interview.
8. Write a follow-up letter.
9. Conduct a job search.
10. Write a letter of resignation.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Trade and Industrial **Course Title:** Graphic Arts

CIP Code: 48.0201 **Course Length** 1350 Clock Hours - 12 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical shop experience to prepare students for employment in the field of Graphic Arts or to provide supplemental training for persons previously or currently employed in Graphic Arts.

The course provides instruction in the use of tools, test equipment, operating equipment, materials, and processes to produce customer layouts, compositions, and camera-ready copy; produce line negatives, halftone negatives, and contacts; strip line negatives, halftone negatives, and multicolor and process color; produce printing plates, single color proofs and color proofs; and operate cutting, folding, and binding equipment.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The course content is organized into competency-based units of instruction that specify occupational competencies which the student must successfully complete.

Units of Instruction:

I. Orientation
II. Mathematics
III. Cost Awareness
IV. Copy Preparation and Composition
V. Paste-Up Principles and Procedures
VI. Layout and Design
VII. Process Camera
VIII. Stripping
IX. Platemaking
X. Paper
XI. Offset Press
XII. Binding and Finishing
XIII. Job Seeking Skills

Curriculum Competency Outline

UNIT I: Orientation

Competencies:

1. Identify and demonstrate basic shop safety rules.
2. Determine primary and secondary employment opportunities.
3. Develop working knowledge of basic terminology of the industry.
4. Identify and demonstrate proper use of basic tools.
5. Demonstrate a knowledge of legal restrictions.
6. Demonstrate knowledge of printing trade customs.
7. Establish a portfolio.
8. Describe the steps of the offset printing process.
9. Develop good work habits and attitudes.

UNIT II: Mathematics

Competencies:
1. Add, subtract, multiply and divide whole numbers, fractions, and decimals.
2. Demonstrate knowledge of percentages.
3. Demonstrate ability to measure with ruler (line gauge) including: points and picas; 1/16, 1/10, 1/64, etc.; and EN, EM, and THIN space.
4. Demonstrate ability to use micrometer.

UNIT III: Cost Awareness

Competencies:
1. Identify factors involved in production costs.
2. Demonstrate an understanding of overhead costs such as rent, utilities, and equipment cost.
3. Demonstrate an understanding of production supplies costs such as paper, ink, film, plates, and masking sheets.
4. Demonstrate an understanding of labor costs.
5. Demonstrate an understanding of profit.

UNIT IV: Copy Preparation and Composition

Competencies:
1. Demonstrate understanding of copy preparation and composition terminology.
2. Recognize mechanical limitations of production equipment.
3. Recognize type styles and sizes.
4. Prepare copy for typesetting according to mechanical limitations.
5. Demonstrate basic ability to operate typewriter keyboard.
6. Demonstrate knowledge of typesetting keyboard functions.
7. Input prepared copy.
8. Process typeset copy.
9. Proofread copy and make corrections.
10. Paste up copy according to layout.
11. Obtain appropriate approval for continued production.

UNIT V: Paste-Up Principles and Procedures

Competencies:
1. Demonstrate working knowledge of terminology.
2. Demonstrate ability to use proportion scale.
3. Mark dimensions of finished job on paste-up board.
4. Gather all elements for paste-up.
5. Demonstrate ability to paste up job using Rubylith, pmt, and registration marks.
6. Demonstrate pen and ink ruling techniques.

UNIT VI: Layout and Design

Competencies:
1. Demonstrate working knowledge of layout and design terminology.
2. Prepare rough sketch of layout.
3. Identify principles of design.
4. Sketch and lay out an advertisement using effective design principles.
5. Demonstrate ability to crop photograph.
6. Demonstrate an understanding of the color wheel and the interaction of colors.

UNIT VII: Process Camera

Competencies:
1. Demonstrate working knowledge of process camera terminology and darkroom safety.
2. Identify parts of process camera.
3. Prepare darkroom chemicals.
4. Identify various types of film and their uses.

5. Set up a process camera and determine basic exposure for a line exposure film.
6. Set up a process camera and determine basic exposure for a half-tone exposure film.
7. Set up a process camera and determine basic exposure for a line exposure pmt.
8. Set up a process camera and determine basic exposure for a half-tone exposure pmt.
9. Demonstrate ability to use a densitometer.
10. Make a duotone.
11. Make a fake duotone.
12. Rescreen a half-tone illustration.
13. Make a duplicate negative and a film positive.
14. Make a spread and a choke.
15. Make a composite negative.
16. Demonstrate understanding of half-tone screens and screen angles.

UNIT VIII: Stripping

Competencies:

1. Demonstrate working knowledge of stripping terminology.
2. Demonstrate understanding of mechanical limitations of presses.
3. Lay out an unruled flat: (a) wrong reading and (b) right reading.
4. Lay out a ruled flat: (a) wrong reading and (b) right reading.
5. Strip for step-and-repeat.
6. Demonstrate ability to use a pin register system.
7. Scribe and opaque a negative.
8. Strip signature flats for multipage or book printing.
9. Strip for surprinting (double burn).
10. Strip for reverse.
11. Combine line and halftone work.
12. Strip for multicolor line printing.
13. Strip for process color printing.
14. Make a proof from flats.
15. Make a process color proof from flats.

UNIT IX: Platemaking

Competencies:

1. Demonstrate working knowledge of platemaking terminology.
2. Match plates with specific jobs.
3. Identify types of platemaking.
4. Determine correct plate exposure.
5. Expose and process a plate: (a) additive (two-step) and (b) subtractive.
6. Expose and process a step-and-repeat plate.
7. Expose and process a screen tint.
8. Expose and process a two-color job.
9. Make corrections on a plate: (a) repair an image and (b) delete an image.
10. Expose a photo-direct plate.
11. Expose and develop proof paper from negative.

UNIT X: Paper

Competencies:

1. Demonstrate a working knowledge of terminology.
2. Explain the different types, weights, and standard sizes of paper.
3. Explain the uses of the various types of paper.
4. Explain the relationship between grain direction and each of the following: (a) press work and (b) finishing work.
5. Use formula for cutting paper stock.
6. Use formula to determine number of sheets to be used for a printing job.
7. Make a combination cut using stock cutting formulas.
8. Draw a cutting diagram.

UNIT XI: Offset Press

Competencies:

1. Demonstrate a working knowledge of offset press terminology.
2. Identify and demonstrate offset press safety rules.
3. Identify basic systems and the cylinders in a typical offset press: (a) sheet fed and (b) perfector.
4. Demonstrate an understanding of preventive maintenance and troubleshooting.
5. Determine lubrication requirements for specific presses.
6. Set up a preventive maintenance schedule in chart form.
7. Adjust dampener rollers to plate cylinder.
8. Adjust ink form rollers to plate cylinder.
9. Adjust plate cylinder to blanket cylinder.
10. Adjust blanket cylinder to impression cylinder.
11. Change a molleton cover.
12. Degrease plate and impression cylinder.
13. Deglaze ink rollers and blanket.
14. Change blanket.
15. Distinguish between different kinds of ink and paper and their uses.
16. List components of ink and their properties.
17. Demonstrate understanding of Pantone Matching Systems (PMS).
18. Mix a PMS ink.
19. Identify dampening chemistry.
20. Test solutions for pH.
21. Make ready and run press for a single-color job: (a) feeder system, (b) printing system, and (c) delivery system.
22. Perform wash-up procedures.
23. Make ready and run press for a multicolor job: (a) loose register and (b) close register.
24. Make ready and run press for a process color job.

UNIT XII: Binding and Finishing

Competencies:

1. Demonstrate a working knowledge of binding and finishing terminology.
2. Identify and demonstrate safety rules applied to binding and finishing.
3. Demonstrate the ability to make ready and complete a single fold.
4. Demonstrate the ability to make ready and complete a multi-fold with right angle (4-, 8-, 16-page signature).
5. Demonstrate the ability to drill paper stock: (a) drill corner rounding and (b) slitting.
6. Demonstrate the ability to make ready and run a flat stitcher and a saddle stitcher.
7. Demonstrate the ability to make ready and perforate/score and number.
8. Demonstrate ability to make ready and operate paper cutter.
9. Demonstrate the ability to pad bond paper and carbonless paper.
10. Demonstrate the ability to make ready and operate a collator.

UNIT XIII: Job Seeking Skills

Competencies:

1. Prepare a resume'.
2. Write a letter of application.
3. Complete an application form.
4. Practice interview questions.
5. Make an appointment for a job interview.
6. Write a follow-up letter or make a follow-up phone call after an interview for a job.
7. Demonstrate appropriate grooming for interview.
8. Evaluate a job offer.
9. Compare job opportunities.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education
Competency-Based Course Outline

Program Area: Trade and Industrial **Course Title:** Heavy Equipment Mechanic

CIP Code: 47.0302 **Course Length** 1350 Clock Hours - 12 Months

Course Description:

The purpose of this course is to prepare individuals to maintain, repair and overhaul heavy equipment such as bulldozers, cranes, graders, crawler-mounted shovels, draglines and compressors. Instruction includes engines, electrical systems, fuel systems, tracks, brake systems, hydraulic and pneumatic systems, power transfer and drive systems, chassis, and test operation of repaired equipment. The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, troubleshooting, and techniques of oxyacetylene equipment. The course content is organized into competency-based units of instruction that specify occupational competencies which the individual must successfully complete.

Units of Instruction:
I. Occupational Introduction
II. Safety
III. Tools and Equipment
IV. Oxyacetylene Equipment
V. Engine Operating Principles
VI. Cooling Systems
VII. Fuel Systems
VIII. Lubrication Systems
IX. Air Induction and Exhaust Systems
X. Electrical Systems
XI. Brake Systems
XII. Power Trains
XIII. Hydraulics and Pneumatics
XIV. Equipment Operation
XV. Preventive Maintenance
XVI. Job Seeking Skills

Curriculum Competency Outline

UNIT I: Occupational Introduction

Competencies:
1. Describe the field of heavy equipment mechanics.
2. Identify working conditions involved with heavy equipment mechanics.
3. Identify job hazards associated with the field of heavy equipment mechanics.
4. List salary and benefits associated with employment in the heavy equipment mechanics field.
5. Describe the job opportunities available for heavy equipment mechanics.
6. Identify initial investment requirements for professional mechanics.
7. Demonstrate willingness to learn.
8. Write legibly.

9. Listen attentively.
10. Prepare written communications.
11. Exhibit dependability.
12. Demonstrate punctuality.
13. Follow rules and regulations.
14. Read and comprehend written communication and information found in technical manuals.
15. Meet flat-rate maintenance schedule.

UNIT II: Safety

Competencies:

1. Wear personal protective clothing.
2. Wear safety goggles.
3. Remove jewelry prior to performing work.
4. Jump start a vehicle according to safety regulations.
5. Secure and block equipment for maintenance.
6. Maintain and use tools in a safe manner.
7. Use equipment safely.
8. Use extreme caution when handling battery acids.
9. Adhere to safety regulations when working with toxic chemicals.
10. Comply with proper housekeeping practices.
11. Locate and use fire extinguishers.
12. Report and correct hazards.
13. Use safety latch on all raised equipment pieces.
14. Use hoists and slings in a safe manner.
15. Operate a forklift according to manufacturer's specifications.
16. Use compressed air safely.
17. Observe safety practices when working with oxyacetylene equipment.

UNIT III: Tools and Equipment

Competencies:

1. Identify basic hand tools.
2. Use hand tools correctly.
3. Use precision measuring equipment.
4. Use steam cleaner.
5. Use high pressure cleaning equipment.
6. Use oxyacetylene equipment.
7. Use pneumatic tools.
8. Use pullers.
9. Use electric tools such as drills, grinders, sanders, and hones.
10. Use pressure gauges and flow meters.
11. Use a battery hydrometer.
12. Use coolant tester.
13. Use "oil sample" tool.
14. Use torque wrenches.
15. Use volt-ohmmeters, digital and analog.
16. Use timing devices (strobe light and rpm indicator).
17. Use hoist.
18. Use winches.
19. Use forklift.
20. Use cherry picker.
21. Use taps and dies.
22. Use undercarriage measuring tools.
23. Use an ease-out to remove a broken stud.
24. Use hydraulic presses.
25. Use a rpm gauge.

26. Use hydraulic jacks.
27. Use radiator cap pressure tester.
28. Use a pyrometer.
29. Use sledge hammers.
30. Use pin knockers.
31. Use a four-to-one multiplier.

UNIT IV: Oxyacetylene Equipment

Competencies:

1. Observe all safety practices for oxyacetylene cutting and welding equipment.
2. Set up, adjust torch, and shut down oxyacetylene equipment.
3. Cut metal of various thicknesses and shapes.
4. Demonstrate a knowledge of brazing metals.
5. Demonstrate a knowledge of metals for inspection purposes on equipment.

UNIT V: Engine Operating Principles

Competencies:

1. Identify engine nomenclature.
2. Identify types of engines.
3. Differentiate between two-cycle and four-cycle engines.
4. Trace the delivery of fuel through a fuel injection system.
5. Identify the parts of a diesel fuel injection system.
6. Disassemble, identify, inspect, and reassemble a diesel engine.
7. Identify cooling system parts.
8. Trace the flow of coolant through an engine.
9. Identify lubrication system parts.
10. Trace the flow of oil through an engine.
11. Identify the intake and exhaust system parts for a diesel engine.
12. Trace the flow of intake air and exhaust gases through an engine.

UNIT VI: Cooling Systems

Competencies:

1. Identify cooling system parts.
2. Remove and replace water pump.
3. Remove and replace radiator.
4. Check coolant for proper freeze protection.
5. Remove and replace coolant.
6. Remove, test and replace thermostat.
7. Perform chemical flush of cooling system.
8. Remove and replace V-belts.
9. Remove and replace hoses.
10. Remove and replace fan.
11. Clean exterior of radiator.
12. Check coolant inhibitors.
13. Demonstrate a knowledge of engine safety devices such as overheating shutdown mechanism and low coolant level.

UNIT VII: Fuel Systems

Competencies:

1. Identify the parts of a diesel fuel injection system.
2. Remove and replace transfer pump.
3. Remove and replace fuel injector.
4. Remove and replace fuel lines, fittings, and cap lines.
5. Change fuel filters.
6. Bleed fuel system.
7. Change water separators.
8. Take fuel sample.

9. Remove and replace fuel injection pump.
10. Remove, flush, and replace fuel tank.
11. Change filter, check screen, and drain trap on fuel tank.
12. Demonstrate a knowledge of emergency shutdown mechanisms on the fuel system.

UNIT VIII: Lubrication Systems

Competencies:

1. Identify the parts of a lubrication system.
2. Identify oil classifications.
3. Change oil and filter.
4. Cut and inspect oil filter for contaminants.
5. Check oil pressure on a live engine using a manual gauge.
6. Take an oil sample.
7. Demonstrate a knowledge of low oil pressure emergency shutdown mechanisms.

UNIT IX: Air Induction and Exhaust Systems

Competencies:

1. Identify parts of air induction and exhaust systems.
2. Remove, inspect, and replace air cleaner.
3. Check air cleaner indicator for correct operation.
4. Check air induction system for leaks.
5. Remove and replace turbocharger.
6. Remove and replace gaskets on intake and exhaust manifolds.
7. Remove and replace blower.
8. Check exhaust back pressure.
9. Remove and replace an engine head.
10. Check exhaust temperature with a pyrometer.
11. Demonstrate a knowledge of checking noise level of exhaust systems.
12. Demonstrate a knowledge of emergency shutdown.

UNIT X: Electrical Systems

Competencies:

1. Identify system components.
2. Read electrical schematics.
3. Demonstrate a knowledge of basic electricity.
4. Remove and replace electrical components.
5. Use electrical test equipment such as volt-ohmmeter, etc.
6. Identify electrical circuits.
7. Use jumper cables and jumper batteries on 12- and 24-volt systems.
8. Service batteries.
9. Splice wire.
10. Charge a battery.
11. Check electrolyte with hydrometer.
12. Connect batteries in series and in parallel.
13. Demonstrate a knowledge of emergency shutdown circuits.

UNIT XI: Brake Systems

Competencies:

1. Identify system components.
2. Read schematics for air and hydraulic brake systems.
3. Fill master cylinder with fluid.
4. Identify different types of brake systems.
5. Remove and replace an air brake chamber.
6. Perform brake check for correct operation according to manufacturer's specifications.
7. Install brake linings on brake shoes.
8. Remove, inspect, adjust, and replace parking brakes.
9. Demonstrate a knowledge of the following brake cylinders: hydraulic, air-over-hydraulic, and air.

UNIT XII: Power Trains

Competencies:

1. Identify system components.
2. Service and take oil samples on system components.
3. Cut open and inspect filters.
4. Remove transmissions.
5. Remove and replace undercarriage components.
6. Remove and replace universal joints.
7. Remove and replace drive line.
8. Remove steering clutches and brakes.
9. Remove torque converter.
10. Check flywheel and flywheel housing runout using a dial indicator.
11. Check oil in idler and rollers on undercarriage.
12. Adjust tracks.
13. Remove axles and planetaries.
14. Demonstrate a knowledge of undercarriage wear and functions.
15. Demonstrate a knowledge of recoil spring danger on undercarriage.

UNIT XIII: Hydraulics and Pneumatics

Competencies:

1. Demonstrate a knowledge of basic hydraulics.
2. Read hydraulic schematics.
3. Identify hydraulic symbols.
4. Observe standard safety practices involved in hydraulic cylinder removal and installation.
5. Tear down, inspect, mike, repair, and assemble hydraulic cylinders.
6. Use a hydraulic flowmeter.
7. Demonstrate a knowledge of cleaning a contaminated hydraulic system.
8. Remove and replace lines and fittings.
9. Remove and replace an air compressor.
10. Service and drain air system tanks of contaminants.

UNIT XIV: Equipment Operation

Competencies:

1. Perform start-up procedures for equipment according to manufacturer's specifications.
2. Operate heavy equipment according to manufacturer's specifications for maintenance purposes only.
3. Rig equipment for maintenance purposes.
4. Use winches.
5. Use hoists.
6. Identify types of cables.
7. Remove, inspect, and install cables.
8. Inspect conventional hydraulic booms (cords and lacing) for defects.

UNIT XV: Preventive Maintenance

Competencies:

1. Identify what preventive maintenance is for industrial equipment.
2. Perform preventive maintenance procedures according to manufacturer's specifications.
3. Demonstrate a knowledge of setting up a preventive maintenance program for heavy equipment.
4. Keep records on preventive maintenance performed including mileage and hour meter readings.
5. Identify components on equipment that require more attention to prevent equipment shutdown.

6. Inspect tires for defects and proper air pressure.
7. Demonstrate a knowledge of troubleshooting techniques according to manufacturer's specifications.

UNIT XVI: Job Seeking Skills

Competencies:

1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.
5. Complete a job application.
6. Participate in a mock interview.
7. Write a follow-up letter.
8. Conduct a job search.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Trade and Industrial

Course Title: Heavy Equipment Operator

CIP Code: 49.0202

Course Length 1125 Clock Hours - 10 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical experience to prepare individuals to operate and maintain a backhoe and front end loader, bulldozer, cherry picker, track backhoe, motor grader, forklift, friction rigs, self-propelled compaction equipment, air compressors, and pumps. Includes instruction in digging, loading, ditching, sloping, grading, stripping, backfilling, clearing, and excavating. The content includes human relations and employability skills, safe and efficient work practices, use of technical manuals, rigging, and job survey controls. The content is organized into competency-based instructional units which specify occupational competencies the individual must successfully complete.

Units of Instruction:

I. Occupational Introduction
II. Safety
III. Mechanical Operation
IV. Prestart-Up Inspection
V. Service Equipment
VI. Job Survey Controls
VII. Backhoe and Front End Loader
VIII. Dozer
IX. Rigging
X. Cherry Picker
XI. Track Backhoe
XII. Motor Grader
XIII. Self-Propelled Compaction Equipment
XIV. Air Compressor and Pumps
XV. Forklift
XVI. Friction Rigs
XVII. Job Seeking Skills

Curriculum Competency Outline

UNIT I: Occupational Introduction

Competencies:

1. Describe the field of heavy equipment operation.
2. Identify working conditions involved with heavy equipment operation.
3. Identify job hazards associated with the field of heavy equipment operation.
4. List salary and benefits associated with employment in the heavy equipment operation field.
5. Describe the job opportunities available for heavy equipment operators.
6. Exhibit dependability.
7. Demonstrate punctuality.
8. Follow rules and regulations.

9. Read and comprehend written communications and information found in technical manuals.
10. Demonstrate personal hygiene and cleanliness.
11. Utilize equipment correctly.
12. Work productively with others.
13. Exhibit pride and loyalty.
14. Demonstrate problem-solving skills.
15. Show empathy, respect and support for others.
16. Show job responsibilities concerning equipment operation, personnel safety and job area.

UNIT II: Safety

Competencies:

1. Identify and wear personal safety gear according to trade standards and/or safety regulations.
2. Refer to operator's manual for correct/safe operation of equipment.
3. Identify job site hazards such as personnel, powerlines, buried facilities, etc.
4. Report/correct unsafe acts or problems.
5. Demonstrate the ability to operate fire extinguishers and identify proper use of the types of fire extinguishers.
6. Maintain all safety devices on equipment such as back-up alarms.
7. Exhibit proper mounting and dismounting procedures.
8. Operate equipment in accordance with trade and Occupational Safety and Health Act (OSHA) standards.
9. Perform operation of equipment from designated signal person only.
10. Identify job hazards associated with defects, hydraulic, and fuel systems that could cause operator injury.
11. Demonstrate the ability to control machinery in case of an emergency.

UNIT III: Mechanical Operation

Competencies:

1. Demonstrate a knowledge of the principles of operation of diesel and gasoline engines.
2. Demonstrate a knowledge of the principles of hydraulics.
3. Troubleshoot equipment in accordance with correct operating sounds and functions.
4. Demonstrate a knowledge of power flow from engine through the power train.
5. Demonstrate a knowledge of the importance of filtering systems on heavy equipment.

UNIT IV: Prestart-Up Inspection

Competencies:

1. Perform prestart-up inspection according to manufacturer's specificaitons (operator's manual).
2. Check all fluid levels according to the manufacturer's specifications.
3. Check operating controls for correct operation.
4. Check machine log for last service date.
5. Perform visual inspection of equipment.
6. Perform necessary lubrication on equipment.
7. Maintain records on equipment.
8. Demonstrate a knowledge of the types of fluids used in heavy equipment.
9. Perform minor preventive maintenance, such as drain water from air reservoirs.

UNIT V: Service Equipment

Competencies:

1. Perform all service procedures according to manufacturer's specifications.
2. Change engine oil and filter.
3. Change hydraulic oil filter.

4. Change air filters.
5. Change torque converter and transmission filters.
6. Change fuel filters.
7. Check and maintain fluid levels such as transmission planetary drives.
8. Drain water from air reservoirs.
9. Service batteries.
10. Check brakes, clutches, belts, tracks, and linkages for defects and correct operation.
11. Drain water from fuel separators.
12. Drain condensation from gear case.
13. Keep and maintain service records on heavy equipment.

UNIT VI: Job Survey Controls

Competencies:
1. Read an engineer's rule.
2. Identify field survey legends and/or nomenclature.
3. Transfer grade using a hand level and tape.
4. Demonstrate a knowledge of project blueprints.
5. Identify occupational terminology used in industry.

UNIT VII: Backhoe and Front End Loader

Competencies:
1. Observe warning signs for buried facilities.
2. Perform start-up procedures.
3. Demonstrate the ability to operate the controls of a backhoe and front end loader.
4. Perform ditch-digging operation.
5. Dig a manhole to specifications.
6. Dig a sloped ditch.
7. Dig a graded ditch to specifications.
8. Load a dump truck with front end loader.
9. Back-fill a ditch.
10. Set a culvert using front end loader.
11. Load, tie down, and unload backhoe-loader on transport vehicle.

UNIT VIII: Dozer

Competencies:
1. Perform start-up procedures according to manufacturer's specifications.
2. Demonstrate the ability to operate the controls of a dozer.
3. Push dirt.
4. Perform leveling procedure.
5. Carry a grade using grade stakes, etc.
6. Grade a slope.
7. Perform back-filling procedures.
8. Demonstrate a knowledge of clearing and burning procedures.
9. Clean undercarriage of debris.
10. Check winch cable for defects.
11. Load, tie down, and unload dozer on transport vehicle.

UNIT IX: Rigging

Competencies:
1. Identify components used for rigging.
2. Observe all safety regulations regarding rigging techniques.
3. Identify bad rigging practices.
4. Rig a load using a two-part spreader.
5. Rig a load using a choker hitch.
6. Rig a load using a basket hitch.

UNIT X: Cherry Picker

Competencies:

1. Identify safe operating procedures for cherry picker.
2. Perform start-up procedures.
3. Demonstrate the ability to operate controls of cherry picker.
4. Set up machine for stable operation.
5. Operate machine in all positions under no load.
6. Lift load in nonextended position according to load chart.
7. Lift load in extended position according to load chart.
8. Perform multiple functions with load.
9. Transport people in personnel basket.
10. Load, tie down, and unload cherry picker on transport vehicle.
11. Check cable for defects.
12. Perform all lifting and traveling operations according to manufacturer's specifications.
13. Travel with load.
14. Demonstrate a knowledge of hand signals used with cherry picker operations.

UNIT XI: Track Backhoe

Competencies:

1. Perform start-up procedures.
2. Demonstrate the ability to operate the controls of a track backhoe.
3. Perform a ditch-digging operation.
4. Dig a graded ditch.
5. Dig a manhole to specifications.
6. Load a dump truck.
7. Load, tie down, and unload track backhoe on transport vehicle.
8. Identify overhead and buried hazards before operating track backhoe.

UNIT XII: Motor Grader

Competencies:

1. Perform start-up procedures.
2. Identify hazards associated with operating a motor grader.
3. Demonstrate the ability to operate the controls of a motor grader.
4. Level spot-dumped materials.
5. Cut a vee ditch.
6. Cut a swale ditch.
7. Blend and mix materials.
8. Build and blade a haul road.
9. Cut a blue-top grade.
10. Load, tie down, and unload a motor grader on transport vehicle.

UNIT XIII: Self-Propelled Compaction Equipment

Competencies:

1. Perform start-up procedures according to manufacturer's specifications.
2. Demonstrate the ability to operate the controls of self-propelled compaction equipment.
3. Follow a pattern to compact materials.
4. Maintain correct air pressure in all tires on a rubber-tired compact machine.
5. Recognize stability problems of rubber-tired compact machines.
6. Maintain water supply on steel wheel roller for asphalt work.

UNIT XIV: Air Compressor and Pumps

Competencies:

1. Perform start-up and shut-down procedures.
2. Demonstrate the ability to operate the controls of air compressors.
3. Connect, secure and disconnect hoses.
4. Check line oiler and moisture separators.

5. Prime a pump.
6. Perform start-up procedures for various types of pumps.
7. Troubleshoot pump and hoses.
8. Operate various types of pumps.

UNIT XV: Forklift

Competencies:

1. Demonstrate a knowledge of safe operating procedures for a forklift.
2. Perform start-up procedure.
3. Demonstrate the ability to operate the controls of a forklift.
4. Balance an uneven load.
5. Load and unload materials.
6. Travel with a load.
7. Ascend and descend a ramp with a load.
8. Retrieve and place a load at maximum height reach of forklift.
9. Lift, lower, and transport people in personnel basket.
10. Demonstrate a knowledge of machine performance capability and specifications.
11. Load, tie down, and unload forklift on transport vehicle.

UNIT XVI: Friction Rigs

Competencies:

1. Identify hazards associated with equipment with booms.
2. Perform start-up procedures for wet and dry weather.
3. Demonstrate the ability to operate the controls of a friction rig.
4. Demonstrate a knowledge of hand signals used for friction rigs.
5. Transfer material using a clam basket.
6. Dig a ditch for a pipeline using a drag bucket.
7. Dig a graded ditch.
8. Dig a sloped ditch.
9. Load truck with a drag bucket.
10. Load and unload truck using hook and observing hand signals.
11. Perform component erection using hook and observing hand signals.
12. Load, tie down, and unload friction rig on transport vehicle.

UNIT XVII: Job Seeking Skills

Competencies:

1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.
5. Complete a job application.
6. Participate in a mock interview.
7. Write a follow-up letter.
8. Conduct a job search.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education
Competency-Based Course Outline

Program Area: Trade and Industrial

Course Title: Industrial Electronics

CIP Code: 47.0105

Course Length 2700 Clock Hours - 24 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical shop experience to prepare students for employment in a variety of jobs in the field of Industrial Electronics or to provide supplemental training for persons previously or currently employed in related Industrial Electronics occupations.

The Industrial Electronics course generally prepares individuals to assemble, install, operate, maintain, and repair electrical/electronic equipment used in industry and manufacturing. Includes instruction in using actual equipment, in various types of equipment such as power supplies, amplifiers, motors, controls, digital and computer circuitry, synchro and servomechanisms, mechanical-power-transfer systems, hydraulic systems, and three-phase ac, electronic wave-shaping, control circuitry, programmable controllers, computer and peripheral business applications, and general robotics applications in industrial/manufacturing industries.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The content is organized into competency-based units of instruction which specify occupational competencies which the student must successfully complete.

Units of Instruction:

FIRST YEAR
I. Fundamentals of Electricity/Electronics
II. Mathematics
III. Physics
IV. Fundamentals of Semiconductors
V. Basic Electronic Circuits
VI. Digital Electronics
VII. Basic Microprocessors
VIII. Computer Literacy

SECOND YEAR
IX. Microprocessor Interfacing
X. Communications Principles
XI. Video Principles
XII. Telecommunications
XIII. Introduction to Programming

Business Specialty
XIV. Microcomputers/Interfacing
XV. Peripherals
XVI. Troubleshooting and Servicing
XVII. Customer Service and Human Relations
XVIII. Job Seeking Skills

Industrial/Manufacturing Specialty
XIV. National Electrical Code (NEC)
XV. Generators and Motors
XVI. Transformers
XVII. Control Systems and Devices
XVIII. Introduction to Instrumentation
XIX. Programmable Controllers
XX. Introduction to Robotics
XXI. Customer Service and Human Relations
XXII. Job Seeking Skills

FIRST YEAR

UNIT I: Fundamentals of Electricity/Electronics

Competencies:

1. Demonstrate a knowledge of occupational job requirements, working conditions, safety hazards, pay scales, and career opportunities.
2. Identify safety hazards.
3. Demonstrate a knowledge of common safety rules and regulations.
4. Identify hand tools.
5. Demonstrate proper techniques and use of hand tools.
6. Apply correct soldering techniques.
7. Identify electrical/electronic test instruments.
8. Perform measurements using electrical/electronic test instruments.
9. Identify terms associated with electricity/electronics.
10. Identify electrical/electronic symbols.
11. Identify electrical/electronic formulas.
12. Identify electrical/electronic components.
13. Display a knowledge of atomic theory.
14. Demonstrate a knowledge of theory of ac and dc current flow.
15. Solve problems using the basic laws governing electron flow.
16. Connect electrical/electronic components in specified circuit configuration.
17. Apply safety practices.

UNIT II: Mathematics

Competencies:

1. Solve problems dealing with fractions, percentages, ratio and proportion, and powers of ten.
2. Solve problems of plane and solid geometry.
3. Solve problems using algebraic formulas.
4. Solve problems using logarithms.
5. Apply the principles in trigonometry in solving problems.
6. Solve problems using a scientific electronic calculator.

UNIT III: Physics

Competencies:

1. State the properties of matter.
2. Demonstrate the applications and effects of force, work, rate, momentum, resistance, power, potential and kinetic energy, force transformers, energy converters, transducers, vibration and waves, time constants, and radiation using mechanical energy systems.
3. Demonstrate the applications and effects of force, work, rate, momentum, resistance, power, potential and kinetic energy, force transformers, energy converters, transducers, vibration and waves, time constants, and radiation using fluidal energy systems.
4. Demonstrate the applications and effects of force, rate, resistance, power, potential and kinetic energy, force transformers, energy converters, transducers, vibration and waves, time constants, and radiation using electrical energy systems.
5. Demonstrate the applications and effects of force, work, rate, resistance, power, potential and kinetic energy, energy converters, transducers, time constants, and radiation using thermal energy systems.

UNIT IV: Fundamentals of Semiconductors

Competencies:

1. Identify terms associated with semiconductors.
2. Identify semiconductor symbols.
3. Identify semiconductor components.
4. Describe the characteristics of semiconductors.
5. Test various semiconductor devices.
6. Interpret semiconductor specification sheets.
7. Demonstrate the procedures for testing and servicing semiconductors.
8. Identify safety hazards associated with semiconductor devices.
9. Apply safety practices.

UNIT V: Basic Electronic Circuits

Competencies:

1. Identify terms associated with power supplies, amplifiers, and oscillators.
2. Identify schematic representations of power supplies, amplifiers, and oscillator circuits.
3. State the theory of operation of power supply circuits, amplifier circuits and oscillator circuits.
4. Construct and analyze various power supply circuits, amplifier circuits, and oscillator circuits.
5. Identify safety practices associated with basic electronic circuits.
6. Apply safety practices.

UNIT VI: Digital Electronics

Competencies:

1. Identify logic gate configuration.
2. Describe the truth tables associated with various logic circuits.
3. Simplify logic circuits using specified techniques.
4. Interpret integrated circuit specification sheets.
5. Identify registers, counters, multivibrators (bistable, monostable, etc.) and display devices.
6. Describe digital-to-analog and analog-to-digital techniques.
7. Analyze digital arithmetic circuits.
8. Identify safety hazards associated with digital circuits.
9. Apply safety practices.

UNIT VII: Basic Microprocessors

Competencies:

1. Identify terms associated with microprocessors.
2. Describe the basic architecture of a microprocessor.
3. Describe the basic operation of a microprocessor.
4. Demonstrate a fundamental knowledge of assembly language programming.
5. Describe system interfacing circuits and techniques.

UNIT VIII: Computer Literacy

Competencies:

1. Identify terms associated with computers.
2. Identify the impact of computers on today's society.
3. Demonstrate ability to select hardware and software components.

SECOND YEAR

UNIT IX: Microprocessor Interfacing

Competencies:
1. Identify terms associated with microprocessor interfacing.
2. Describe the various methods used for input/output operations.
3. Describe techniques for digital-to-analog and analog-to-digital conversion using microprocessors.
4. Demonstrate a knowledge of various communication techniques.
5. Demonstrate a knowledge of peripheral input/output devices.
6. Demonstrate a knowledge of various types of storage devices.
7. Demonstrate microprocessor programming techniques.
8. Demonstrate a knowledge of combining a Central Processing Unit (CPU) with support circuits to form a microprocessor system.

UNIT X: Communications Principles

Competencies:
1. Identify terms associated with radio receivers.
2. Identify the functions of the various stages that make up a radio receiver.
3. Troubleshoot a receiver using signal tracing methods.
4. Troubleshoot a receiver using signal injection methods.
5. Align AM/FM radio receiver.
6. Demonstrate a knowledge of amplitude and frequency modulation principles.

UNIT XI: Video Principles

Competencies:
1. Identify terms associated with video systems.
2. Identify the function of the various stages that make up a television receiver.
3. Demonstrate a knowledge of the various components of a composite video signal.
4. Set up a color television receiver.
5. Perform basic troubleshooting techniques.

UNIT XII: Telecommunications

Competencies:
1. Identify terms associated with telecommunications.
2. Identify the function of the various stages of amplitude modulated (AM), frequency modulated (FM), and single sideband (SSB) receivers.
3. Demonstrate an ability to set up and test a radio receiver.
4. Identify the function of the various stages of AM, FM, and SSB transmitters.
5. Demonstrate an ability to set up and test transmitters.
6. Demonstrate a knowledge of the installation, adjustment, and servicing of antennas and transmission lines.
7. Demonstrate a knowledge of the functional parts of a telephone system.
8. Demonstrate a knowledge of satellite ground systems.
9. Identify components and explain their function in a microwave system.
10. Demonstrate a knowledge of multiplexing systems.
11. Perform operational tests on a microwave system.

UNIT XIII: Introduction to Programming

Competencies:
1. Identify terms associated with programming.
2. Demonstrate an ability to write and run a program for a specific task.
3. Demonstrate a knowledge of the major programming languages.

BUSINESS SPECIALTY

UNIT XIV: Microcomputers/Interfacing

Competencies:
1. Identify terms associated with microcomputers.
2. Demonstrate a knowledge of the components of a microcomputer.

3. Demonstrate a knowledge of the functions of the components of a microcomputer.
4. Assemble a microcomputer.
5. Program a microcomputer.
6. Troubleshoot a microcomputer.

UNIT XV: Peripherals

Competencies:

1. Identify terms associated with computer peripherals.
2. Demonstrate a knowledge of input/output communication standards.
3. Demonstrate a knowledge of the purpose and functions of various computer peripheral devices.
4. Demonstrate a knowledge of the techniques of data communications.
5. Assemble a microcomputer system and demonstrate its operation.
6. Troubleshoot and service computer peripherals.

UNIT XVI: Troubleshooting and Servicing

Competencies:

1. Demonstrate a knowledge of the proper selection and use of computer troubleshooting tools and equipment.
2. Demonstrate a knowledge of troubleshooting procedures.
3. Perform troubleshooting techniques on components of a computer system.
4. Perform preventive maintenance on a computer system.

UNIT XVII: Customer Service and Human Relations

Competencies:

1. Identify terms associated with human relations.
2. Demonstrate a willingness to learn.
3. Demonstrate a professional attitude.
4. Demonstrate the ability to be a good listener.
5. Demonstrate the ability to follow oral and written instructions.
6. Demonstrate the ability to communicate instructions accurately and effectively.
7. Demonstrate high reliability in the performance of duties.
8. Demonstrate problem-solving skills.
9. Demonstrate punctuality.
10. Exhibit pride and loyalty.
11. Comply with safety and health rules.
12. Demonstrate personal hygiene and cleanliness.
13. Show empathy, respect, and support for others.
14. Write legibly.
15. Practice good telephone etiquette.
16. Demonstrate the ability to write an effective technical report.
17. Demonstrate equipment and software operation.
18. Determine the problem and formulate a plan.
19. Perform the service.
20. Complete the transaction.
21. Identify terms associated with business/administrative practices.
22. Prepare service bills.
23. Maintain customer accounts and records.
24. Maintain equipment inventory and parts control.
25. Read and interpret parts/service manuals.
26. Maintain parts/service manual revisions.
27. Execute maintenance contracts and service agreements.
28. Demonstrate a knowledge of the cost factor in doing business.

UNIT XVIII: Job Seeking Skills

Competencies:

1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.
5. Write a letter of application.
6. Complete a job application.
7. Participate in a mock interview.
8. Write a follow-up letter.
9. Conduct a job search.
10. Write a letter of resignation.

INDUSTRIAL/MANUFACTURING SPECIALTY

UNIT XIV: National Electrical Code (NEC)

Competencies:

1. Identify terms associated with the National Electrical Code.
2. Demonstrate a knowledge of the National Electrical Code.
3. Identify National Electrical Code applications.

UNIT XV: Generators and Motors

Competencies:

1. Identify terms associated with motors and generators.
2. Demonstrate a knowledge of the principles of electrical generators.
3. Demonstrate a knowledge of the characteristics of various types of generators.
4. Demonstrate a knowledge of the characteristics and applications of direct current motors.
5. Demonstrate a knowledge of the characteristics and applications of various types of alternating current motors.
6. Demonstrate a knowledge of the wye and delta power connections.
7. Demonstrate a knowledge of testing motors and generators.
8. Demonstrate a knowledge of troubleshooting motors and generators.

UNIT XVI: Transformers

Competencies:

1. Identify terms associated with power transformers.
2. Demonstrate a knowledge of transformer principles.
3. Demonstrate a knowledge of transformer characteristics.
4. Demonstrate a knowledge of transformer circuit configurations.
5. Test various types of transformers.
6. Troubleshoot various types of transformers.

UNIT XVII: Control Systems and Devices

Competencies:

1. Identify terms associated with control systems and devices.
2. Identify symbols of control systems and devices.
3. Identify components of control systems and devices.
4. Demonstrate a knowledge of the characteristics of control systems and devices.
5. Install control systems and devices.
6. Test control systems and devices.
7. Troubleshoot control systems and devices.
8. Apply safety practices.

UNIT XVIII: Introduction to Instrumentation

Competencies:

1. Identify terms associated with instrumentation.
2. Demonstrate a knowledge of the functions of instrumentation.
3. Identify the various components used in instrumentation.
4. Demonstrate a knowledge of the characteristics of instrumentation and control systems.
5. Test instrumentation and control systems.
6. Troubleshoot instrumentation and control systems.

UNIT XIX: Programmable Controllers

Competencies:

1. Identify terms associated with programmable controllers.
2. Identify symbols associated with programmable controllers.
3. Demonstrate a knowledge of the theory of operation of programmable controllers.
4. Write, edit, and implement a program for a specified task.

UNIT XX: Introduction to Robotics

Competencies:

1. Identify terms associated with robotics.
2. Identify robotic components.
3. Demonstrate a knowledge of robotic fundamentals.
4. Write and run a robotics program.
5. Demonstrate a knowledge of the function of robotic components.
6. Demonstrate a knowledge of data acquisition handling and conversion in robotics.

UNIT XXI: Customer Service and Human Relations

Competencies:

1. Demonstrate the ability to speak effectively.
2. Demonstrate a willingness to learn.
3. Demonstrate a professional attitude.
4. Demonstrate the ability to be a good listener.
5. Demonstrate the ability to follow oral and written instructions.
6. Demonstrate the ability to communicate instructions accurately and effectively.
7. Demonstrate high reliability in the performance of duties.
8. Demonstrate problem-solving skills.
9. Demonstrate punctuality.
10. Exhibit pride and loyalty.
11. Comply with safety and health rules.
12. Demonstrate personal hygiene and cleanliness.
13. Show empathy, respect, and support for others.
14. Write legibly.
15. Practice good telephone etiquette.
16. Demonstrate the ability to write an effective technical report.
17. Demonstrate equipment and software operation.
18. Determine the problem and formulate a plan.
19. Perform the service.
20. Complete the transaction.
21. Identify terms associated with business/administrative practices.
22. Prepare service bills.
23. Maintain customer accounts and records.
24. Maintain equipment inventory and parts control.
25. Read and interpret parts/service manuals.
26. Maintain parts/service manual revisions.
27. Execute maintenance contracts and service agreements.
28. Demonstrate a knowledge of the cost factor in doing business.

UNIT XXII: Job Seeking Skills

Competencies:

1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.
5. Write a letter of application.
6. Complete a job application.
7. Participate in a mock interview.
8. Write a follow-up letter.
9. Conduct a job search.
10. Write a letter of resignation.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Trade and Industrial

Course Title: Industrial Machine Shop

CIP Code: 48.0503

Course Length 1800 Clock Hours - 16 Months

Course Description:

The purpose of this course is to prepare individuals to shape metal parts on machines such as lathes, grinders, drill presses, and milling machines. Computer numerical controlled machines are also utilized. This includes making computations for dimensions and cutting feeds and speeds, using precision measuring instruments, laying out parts, and heat treatment of metals.

The course content is organized into competency-based units of instruction that specify occupational competencies which the student must successfully complete.

Units of Instruction:
I. Orientation and Safety
II. Benchwork
III. Drill Presses
IV. Lathes
V. Milling Machines
VI. Precision Grinding Machines
VII. Computer Numerical Control Machining
VIII. Applied Mathematics
IX. Blueprint Reading
X. Job Seeking Skills

Curriculum Competency Outline

UNIT I.: Orientation and Safety

Competencies:
1. Describe overview of course.
2. Identify shop and school rules.
3. Identify and practice safety rules.

UNIT II: Benchwork

Competencies:
1. Identify and practice safety rules.
2. Identify and use hand tools.
3. Identify and use measuring tools.
4. Identify and use layout tools.
5. Identify ferrous and nonferrous metals.
6. Cut stock with hand hack saw.
7. Cut stock with power hack saw.
8. Cut internal and external threads with taps and dies.
9. Use bench grinder.
10. Sharpen cutting tools.

UNIT III: Drill Presses

Competencies:

1. Identify and practice safety rules.
2. Identify types of drill presses.
3. Identify parts and controls.
4. Lay out holes on parts for drilling.
5. Calculate feeds and speeds.
6. Adjust drill press for feeds and speeds.
7. Drill holes in end of a shaft.
8. Drill holes in diameter of a shaft.
9. Drill holes off center in diameter of a shaft.
10. Drill holes in nonferrous metals.
11. Ream holes.
12. Bore holes with radial drill press.
13. Countersink, counterbore and spot face holes.
14. Remove broken drill bits from parts.

UNIT IV: Lathes

Competencies:

1. Identify and practice safety rules.
2. Identify types of lathes.
3. Identify parts and controls.
4. Calculate feeds and speeds.
5. Adjust lathe for feeds and speeds.
6. Lay out parts for turning.
7. Identify types of cutting tool bits.
8. Grind cutting tool bits.
9. Chuck work in a three-jaw and four-jaw chuck.
10. Attach work to a faceplate.
11. Turn shaft between centers.
12. Drill and ream holes.
13. Use steady rest and follow rest on long shafts.
14. Bore holes to size.
15. Step bore a hole.
16. Cut internal recesses.
17. Perform filing and polishing operations.
18. Turn tapers using taper attachment.
19. Perform knurling operations.
20. Cut internal and external V-threads.
21. Cut internal and external Acme threads.
22. Cut internal and external square threads.
23. Cut internal and external pipe threads.

UNIT V: Milling Machines

Competencies:

1. Identify and practice safety rules.
2. Identify types of milling machines.
3. Identify parts and controls.
4. Calculate feeds and speeds.
5. Adjust milling machine for feeds and speeds.
6. Identify and use work-holding devices.
7. Lay out parts for milling.
8. Cut keyways.
9. Perform straddle and gang milling operations.
10. Perform indexing operations.
11. Perform gear cutting operations.

UNIT VI: Precision Grinding Machines

Competencies:

1. Identify and practice safety rules.
2. Identify types of grinding machines.
3. Identify parts and controls.
4. Identify types of grinding wheels for precision grinding.
5. Identify uses of surface grinders.
6. Identify uses of tool and cutter grinders.
7. Perform dressing and maintenance on grinding wheels.
8. Perform precision grinding operations.

UNIT VII: Computer Numerical Control Machining

Competencies:

1. Identify and practice safety rules.
2. Describe history of Computer Numerical Control (CNC) machining.
3. Identify types of CNC machines.
4. Identify parts and controls.
5. Adjust CNC machines for feeds and speeds.
6. Describe G and M codes.
7. Apply G and M codes.

UNIT VIII: Applied Mathematics

Competencies:

1. Add, subtract, multiply, and divide common fractions.
2. Add, subtract, multiply, and divide decimal fractions.
3. Convert common fractions to decimal fractions.
4. Convert decimal fractions to common fractions.
5. Identify and use metric measures.
6. Perform metric to customary and customary to metric conversions.
7. Solve percentage problems.
8. Solve ratio and proportion problems.
9. Solve square and square root problems.
10. Solve problems involving squares, rectangles, and circles.
11. Identify types of triangles.
12. Solve right triangle problems.
13. Solve oblique triangle problems.

UNIT IX: Blueprint Reading

Competencies:

1. Identify types and uses of blueprints.
2. Describe information in title block, revision block, and notes.
3. Identify terms and symbols.
4. Identify and describe alphabet of lines.
5. Interpret multiview drawings.
6. Interpret section views.
7. Interpret auxiliary views.
8. Interpret pictorial drawings.
9. Interpret dimensions and tolerances.
10. Interpret surface finish marks.
11. Interpret precision dimensions.
12. Interpret geometric tolerances.
13. Identify thread series.
14. Interpret thread notations.

UNIT X: Job Seeking Skills

Competencies:

1. Select means of locating job openings.
2. Prepare a resume'.
3. Write a letter of application.
4. Complete an employment application.
5. Participate in a mock interview.
6. Write a follow-up letter.
7. Make a follow-up phone call.
8. Evaluate a job offer.
9. Compare job opportunities.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Trade and Industrial **Course Title:** Industrial Maintenance Technician

CIP Code: 47.0303 **Course Length** 2700 Clock Hours - 24 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical shop experience to prepare students for employment in a variety of jobs in the field of Industrial Maintenance or to provide supplemental training for persons previously or currently employed in related industrial maintenance occupations.

The Industrial Maintenance Technician course generally prepares individuals to repair and maintain industrial machinery and equipment such as cranes, pumps, engines and motors, pneumatic and hydraulic tools, conveyor systems, production machinery, printing machinery, marine deck machinery, and steam propulsion, refinery, and pipeline-distribution systems. Includes instruction in testing, adjusting, and repairing pneumatic and hydraulic systems; attaching supplemental equipment such as hoses, valves, gates, vibration equipment, and mechanical, electrical or electronic control devices; and maintaining and installing electric motors, switchboards, controls, fans, and starting devices. It also includes instruction in electrical and plumbing codes, occupational safety, and Occupational Safety and Health Agency (OSHA) regulations, welding, boilermaking, refrigeration, and materials handling equipment operations; and the use of test equipment to identify and correct malfunctions.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The content is organized into competency-based units of instruction which specify occupational competencies which the student must successfully complete.

Units of Instruction:

I. Introduction to Industrial Maintenance
II. Math for Technicians
III. Tools and Materials
IV. Documentation
V. Blueprint Reading
VI. Rigging
VII. Pipefitting and Plumbing
VIII. Boilermaker
IX. Welding
X. Millwright and Machinist
XI. Scaffolding
XII. Carpentry
XIII. Insulation
XIV. Equipment Operator
XV. Basic Electricity
XVI. Refrigeration Systems
XVII. Computer Function
XVIII. Human Relations
XIX. Job Seeking Skills

Curriculum Competency Outline

UNIT I: Introduction to Industrial Maintenance

Competencies:

1. Identify terms associated with industrial maintenance.
2. Demonstrate a knowledge of job requirements.
3. Demonstrate a knowledge of the working conditions of an industrial maintenance technician.
4. Demonstrate a knowledge of career opportunities.

5. Demonstrate a knowledge of codes, standards, and regulations.
6. Identify the safety hazards associated with industrial maintenance.

UNIT II: Math for Technicians

Competencies:

1. Solve problems dealing with fractions, percentages, ratio and proportion, and powers of ten.
2. Solve problems of plane and solid geometry.
3. Solve problems using algebraic formulas.
4. Solve problems using logarithms.
5. Apply the principles of trigonometry in solving problems.
6. Solve problems using a scientific electronic calculator.

UNIT III: Tools and Materials

Competencies:

1. Identify terms associated with tools and materials.
2. Identify hand tools.
3. Identify portable power tools.
4. Use hand and portable power tools.
5. Identify measuring tools.
6. Perform measurements using various measuring instruments.
7. Identify terms associated with materials.
8. Identify tubing.
9. Identify piping.
10. Identify fittings for tubing.
11. Identify fittings for piping.
12. Identify types of gasket material.
13. Identify various types of metal fasteners.
14. Identify various types of sealants.
15. Identify various types of lubricants.
16. Identify types of hangers and support brackets.
17. Identify various types of conduit.
18. Identify various types of electrical devices.
19. Identify various types of insulation.
20. Identify safety hazards associated with tools and materials.
21. Apply safety practices.

UNIT IV: Documentation

Competencies:

1. Identify terms associated with documentation.
2. Complete documents associated with job scope, such as: work orders, store requests, permit request systems, lock-out and tag-out forms, accident reports, and equipment history records.
3. Identify sources of codes and standards.
4. Identify the applications of codes and standards to be observed by an industrial maintenance technician.
5. Read and interpret documents.

UNIT V: Blueprint Reading

Competencies:

1. Identify terms associated with blueprints.
2. Identify various types of blueprints.
3. Differentiate between oblique, orthographic, and isometric drawings.
4. Demonstrate the ability to perform sketching techniques.
5. Identify symbols.
6. Demonstrate a knowledge of flow diagrams.
7. Demonstrate a knowledge of specification requirements.
8. Read and interpret blueprints and electrical schematics.

UNIT VI: Rigging

Competencies:

1. Identify terms associated with rigging.
2. Identify rigging equipment.
3. Identify rigging applications.
4. Demonstrate the ability to tie designated types of knots.
5. Demonstrate the ability to communicate with others using approved rigging hand signals.
6. Plan a rigging operation to meet codes and standards.
7. Identify safety hazards associated with rigging operations.

UNIT VII: Pipefitting and Plumbing

Competencies:

1. Identify terms associated with pipefitting and plumbing.
2. Identify pipefitting and plumbing tools.
3. Cut and thread pipe using hand and power tools.
4. Bend tubing.
5. Perform soldering techniques.
6. Make up joints using lead.
7. Install pipe/tubing to meet codes and standards requirements.
8. Identify environmental factors that affect pipefitting and plumbing operations.
9. Identify safety hazards associated with pipefitting and plumbing.
10. Apply safety practices.

UNIT VIII: Boilermaker

Competencies:

1. Identify terms associated with boilermaking.
2. Identify tools associated with boilermaking operations.
3. Identify various types of heat exchangers, boilers, and fractionating columns.
4. Identify the components of heat exchangers, boilers, and fractionating columns.
5. Disassemble, inspect, and reassemble heat exchangers.
6. Identify safety hazards associated with boilermaking.
7. Apply safety practices.

UNIT IX: Welding

Competencies:

1. Identify terms associated with welding.
2. Identify various oxyfuel cutting and welding equipment.
3. Identify the components of oxyfuel equipment.
4. Set up oxyfuel equipment.
5. Perform cutting operations with oxyfuel equipment.
6. Identify safety hazards associated with oxyfuel equipment.
7. Apply safety practices.
8. Identify various types of arc welding equipment.
9. Identify various types of electrodes.
10. Identify the various welding positions.
11. Demonstrate the ability to perform welding operations in the flat, horizontal, vertical, and overhead positions.
12. Pass an American Society of Mechanical Engineers (ASME) Section 9 plate welding test.
13. Demonstrate the ability to perform brazing operations.
14. Identify safety hazards associated with arc welding.
15. Apply safety practices.

UNIT X: Millwright and Machinist

Competencies:

1. Identify terms associated with millwright and machinist.
2. Identify tools used by millwrights and machinists.
3. Identify the various types and applications of pumps.
4. Identify the various types and applications of compressors.
5. Identify the various types and applications of turbines.
6. Identify the various types and applications of conveyors.
7. Identify the various types and applications of materials-handling equipment.
8. Identify various types and applications of bearings.
9. Identify various types and applications of seals.
10. Identify various types and applications of packings.
11. Identify various types and applications of clutches and brakes.
12. Identify the various types and applications of U-joints.
13. Identify the various types and applications of chain drives.
14. Identify the various types and applications of variable speed drives.
15. Identify the various types and applications of gear drives.
16. Identify the various types and applications of couplings.
17. Identify the various types and applications of hydraulic systems.
18. Identify the various types and applications of pneumatic systems.
19. Identify the types of equipment alignments required.
20. Identify the components of pumps.
21. Identify the components of compressors.
22. Identify the components of turbines.
23. Identify the components of conveyors.
24. Identify the components of materials-handling equipment.
25. Identify the components of seals.
26. Identify the components of clutches and brakes.
27. Identify the components of U-joints.
28. Identify the components of chain drives.
29. Identify the components of variable speed drives.
30. Identify the components of gear drives.
31. Identify the components of couplings.
32. Identify the components of hydraulic systems.
33. Identify the components of pneumatic systems.
34. Describe the operation of pumps.
35. Describe the operation of compressors.
36. Describe the operation of turbines.
37. Describe the operation of conveyors.
38. Describe the operation of materials-handling equipment.
39. Describe the function of bearings.
40. Describe the function of seals.
41. Describe the function of packings.
42. Describe the operation of clutches and brakes.
43. Describe the operation of U-joints.
44. Describe the operation of chain drives.
45. Describe the operation of variable speed drives.
46. Describe the operation of gear drives.
47. Describe the function and operation of couplings.
48. Describe the operation of hydraulic systems.
49. Describe the operation of pneumatic systems.
50. Troubleshoot pump problems.
51. Troubleshoot compressor problems.
52. Troubleshoot turbine problems.
53. Troubleshoot conveyor problems.

54. Troubleshoot materials-handling equipment problems.
55. Troubleshoot seal problems.
56. Troubleshoot packing problems.
57. Troubleshoot clutch and brake problems.
58. Troubleshoot U-joint problems.
59. Troubleshoot chain drive problems.
60. Troubleshoot variable speed drive problems.
61. Troubleshoot gear drive problems.
62. Troubleshoot coupling problems.
63. Troubleshoot hydraulic system problems.
64. Troubleshoot pneumatic system problems.
65. Disassemble, inspect, repair and reassemble pumps.
66. Disassemble, inspect, repair and reassemble compressors.
67. Disassemble, inspect, repair and reassemble turbines.
68. Disassemble, inspect, repair and reassemble conveyors.
69. Disassemble, inspect, repair and reassemble materials-handling equipment.
70. Disassemble, inspect, repair and reassemble bearing assemblies.
71. Disassemble, inspect, repair and reassemble seal assemblies.
72. Disassemble, inspect, repair and reassemble packing assemblies.
73. Disassemble, inspect, repair and reassemble clutch and brake assemblies.
74. Disassemble, inspect, repair and reassemble U-joint assemblies.
75. Disassemble, inspect, repair and reassemble chain drive assemblies.
76. Disassemble, inspect, repair and reassemble variable speed drive assemblies.
77. Disassemble, inspect, repair and reassemble gear drive assemblies.
78. Disassemble, inspect, repair and reassemble coupling assemblies.
79. Disassemble, inspect, repair and reassemble hydraulic systems.
80. Disassemble, inspect, repair and reassemble pneumatic systems.
81. Perform equipment installation techniques.
82. Perform equipment alignment techniques.
83. Identify preventive maintenance requirements and procedures for equipment.
84. Identify terms associated with machinist operations and techniques.
85. Identify general machine shop equipment.
86. Describe the function and operation of general machine shop equipment.
87. Identify the components of a machine lathe.
88. Identify the components of a drill press.
89. Identify the components of a key seater.
90. Identify the components of a metal cutting bandsaw.
91. Identify the components of a milling machine.
92. Perform turning operations to specifications on a lathe.
93. Perform threading operations to specifications on a lathe.
94. Perform boring/drilling and countersinking/counterboring operations on a drill press.
95. Perform keyseating operations using a keyseating machine.
96. Cut stock to length using metal cutting bandsaw.
97. Perform refacing and shaping operations using a milling machine.
98. Identify safety hazards associated with millwright and machinist operations.
99. Apply safety practices.

UNIT XI: Scaffolding

Competencies:

1. Identify terms associated with scaffolding.
2. Identify various types of scaffolding.
3. Identify the applications of scaffolding.
4. Demonstrate a knowledge of the Occupational Safety and Health Act (OSHA) requirements.

5. Construct scaffolding to specifications.
6. Identify safety hazards associated with scaffolding.
7. Apply safety practices.

UNIT XII: Carpentry

Competencies:

1. Identify terms associated with carpentry.
2. Identify the applications of carpentry in industrial maintenance.
3. Identify hand tools used by carpenters.
4. Identify measuring tools used by carpenters.
5. Identify power tools used by carpenters.
6. Demonstrate the ability to use carpentry tools.
7. Construct foundation forms and pour concrete.
8. Identify safety hazards associated with carpentry operations.
9. Apply safety practices.

UNIT XIII: Insulation

Competencies:

1. Identify terms associated with insulation.
2. Identify the various types of insulation.
3. Identify the various applications of insulation.
4. Identify safety hazards associated with insulation.
5. Apply safety practices.

UNIT XIV: Equipment Operator

Competencies:

1. Identify terms associated with equipment operations.
2. Demonstrate a knowledge of industry code license requirements.
3. Demonstrate the ability to operate a forklift.
4. Demonstrate the ability to operate a carry-deck crane.
5. Demonstrate the ability to operate a manlift.
6. Demonstrate the ability to operate a 15-ton cherry picker.
7. Identify safety hazards associated with equipment operations.
8. Apply safety practices.

UNIT XV: Basic Electricity

Competencies:

1. Identify terms associated with electricity.
2. Define Ohm's Law.
3. Solve problems in series, parallel, and combination circuit configurations using Ohm's Law.
4. Define magnetism.
5. Describe the relationship of magnetism to electrical circuitry.
6. Identify sources and types of electricity.
7. Identify electrical measuring instruments.
8. Perform voltage, current, and resistance measurements.
9. Demonstrate a knowledge of direct current (dc) theory.
10. Demonstrate a knowledge of alternating current (ac) theory.
11. Demonstrate a knowledge of transformer principles.
12. Demonstrate a knowledge of semiconductors.
13. Identify safety hazards associated with electricity.
14. Apply safety practices.

UNIT XVI: Refrigeration Systems

Competencies:

1. Identify terms associated with refrigeration systems.
2. Demonstrate a knowledge of the principles of refrigeration.

3. Identify the major components of a refrigeration system.
4. Troubleshoot industrial refrigeration system problems.
5. Identify safety hazards associated with refrigeration system servicing.
6. Apply safety practices.

UNIT XVII: Computer Function

Competencies:
1. Identify terms associated with computer functions.
2. Identify the various types of computer functions.
3. Identify the applications of computer functions.
4. Load a system.
5. Demonstrate the use of an operating system.
6. Demonstrate the use of operating system utilities.
7. Describe the function and operation of a programmable logic controller.

UNIT XVIII: Human Relations

Competencies:
1. Identify terms associated with human relations.
2. Demonstrate a willingness to learn.
3. Demonstrate a professional attitude.
4. Demonstrate the ability to be a good listener.
5. Demonstrate the ability to follow oral and written instructions.
6. Demonstrate the ability to communicate instructions accurately and effectively.
7. Demonstrate high reliability in the performance of duties.
8. Demonstrate problem-solving skills.
9. Demonstrate punctuality.
10. Exhibit pride and loyalty.
11. Comply with safety and health rules.
12. Demonstrate personal hygiene and cleanliness.
13. Show empathy, respect, and support for others.
14. Write legibly.

UNIT XIX: Job Seeking Skills

Competencies:
1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.
5. Write a letter of application.
6. Complete a job application.
7. Participate in a mock interview.
8. Write a follow-up letter.
9. Conduct a job search.
10. Write a letter of resignation.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Trade and Industrial **Course Title:** Instrumentation

CIP Code: 47.0401 **Course Length** 2700 Clock Hours - 24 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical shop experience to prepare students for employment in a variety of jobs in the field of Instrumentation or to provide supplemental training for persons previously or currently employed in related instrumentation occupations.

The Instrumentation course generally prepares individuals to maintain and repair various types of meters, measuring devices, and control devices such as heating and air conditioning controls; dial pressure gauges; scales and balances; electrical controlling, measuring, and recording devices; optical, aeronautical, and navigational instruments; and nuclear instrumentation. Includes instruction in diagnosing malfunctions; disassembling, repairing, and/or replacing faulty parts; and cleaning, assembling, and adjusting instruments using special bench tools, hand tools, and other meters and standards.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The content is organized into competency-based units of instruction which specify occupational competencies which the student must successfully complete.

Units of Instruction:

FIRST YEAR

I. Fundamentals of Electricity/Electronics
II. Mathematics
III. Physics
IV. Fundamentals of Semiconductors
V. Basic Electronic Circuits
VI. Digital Electronics
VII. Basic Microprocessors
VIII. Computer Literacy

SECOND YEAR

IX. Introduction to Instrumentation
X. Fundamentals of Measurement
XI. Tools and Materials
XII. Documentation
XIII. Test Equipment
XIV. Final Control Elements
XV. Air Systems
XVI. Gauges, Indicators, and Recorders
XVII. Transmitters, Transducers, and Computing Relays
XVIII. Programmable Logic Controllers
XIX. Introduction to Control Systems
XX. Alarms
XXI. Control Loops
XXII. Logic
XXIII. Data Acquisition
XXIV. Signal Conditioning
XXV. Computing Functions
XXVI. Introduction to Nuclear Instrumentation
XXVII. Human Relations
XXVIII. Job Seeking Skills

Curriculum Competency Outline

FIRST YEAR

UNIT I: Fundamentals of Electricity/Electronics

Competencies:

1. Demonstrate a knowledge of occupational job requirements, working conditions, safety hazards, pay scales, and career opportunities.
2. Identify safety hazards.
3. Demonstrate a knowledge of common safety rules and regulations.
4. Identify hand tools.
5. Demonstrate proper techniques and use of hand tools.
6. Apply correct soldering techniques.
7. Identify electrical/electronic test instruments.
8. Perform measurements using electrical/electronic test instruments.
9. Identify terms associated with electricity/electronics.
10. Identify electrical/electronic symbols.
11. Identify electrical/electronic formulas.
12. Identify electrical/electronic components.
13. Display a knowledge of atomic theory.
14. Demonstrate a knowledge of theory of ac and dc current flow.
15. Solve problems using the basic laws governing electron flow.
16. Connect electrical/electronic components in specified circuit configuration.
17. Apply safety practices.

UNIT II: Mathematics

Competencies:

1. Solve problems dealing with fractions, percentages, ratio and proportion, and powers of ten.
2. Solve problems of plane and solid geometry.
3. Solve problems using algebraic formulas.
4. Solve problems using logarithms.
5. Apply the principles in trigonometry in solving problems.
6. Solve problems using a scientific electronic calculator.

UNIT III: Physics

Competencies:

1. State the properties of matter.
2. Demonstrate the applications and effects of force, work, rate, momentum, resistance, power, potential and kinetic energy, force transformers, energy converters, transducers, vibration and waves, time constants, and radiation using mechanical energy systems.
3. Demonstrate the applications and effects of force, work, rate, momentum, resistance, power, potential and kinetic energy, force transformers, energy converters, transducers, vibration and waves, time constants, and radiation using fluidal energy systems.
4. Demonstrate the applications and effects of force, rate, resistance, power, potential and kinetic energy, force transformers, energy converters, transducers, vibration and waves, time constants, and radiation using electrical energy systems.
5. Demonstrate the applications and effects of force, work, rate, resistance, power, potential and kinetic energy, energy converters, transducers, time constants, and radiation using thermal energy systems.

UNIT IV: Fundamentals of Semiconductors

Competencies:

1. Identify terms associated with semiconductors.
2. Identify semiconductor symbols.
3. Identify semiconductor components.
4. Describe the characteristics of semiconductors.
5. Test various semiconductor devices.
6. Interpret semiconductor specification sheets.
7. Demonstrate the procedures for testing and servicing semiconductors.
8. Identify safety hazards associated with semiconductor devices.
9. Apply safety practices.

UNIT V: Basic Electronic Circuits

Competencies:

1. Identify terms associated with power supplies, amplifiers, and oscillators.
2. Identify schematic representations of power supplies, amplifiers, and oscillator circuits.
3. State the theory of operation of power supply circuits, amplifier circuits and oscillator circuits.
4. Construct and analyze various power supply circuits, amplifier circuits, and oscillator circuits.
5. Identify safety practices associated with basic electronic circuits.
6. Apply safety practices.

UNIT VI: Digital Electronics

Competencies:

1. Identify logic gate configuration.
2. Describe the truth tables associated with various logic circuits.
3. Simplify logic circuits using specified techniques.
4. Interpret integrated circuit specification sheets.
5. Identify registers, counters, multivibrators (bistable, monostable, etc.) and display devices.
6. Describe digital-to-analog and analog-to-digital techniques.
7. Analyze digital arithmetic circuits.
8. Identify safety hazards associated with digital circuits.
9. Apply safety practices.

UNIT VII: Basic Microprocessors

Competencies:

1. Identify terms associated with microprocessors.
2. Describe the basic architecture of a microprocessor.
3. Describe the basic operation of a microprocessor.
4. Demonstrate a fundamental knowledge of assembly language programming.
5. Describe system interfacing circuits and techniques.

UNIT VIII: Computer Literacy

Competencies:

1. Identify terms associated with computers.
2. Identify the impact of computers on today's society.
3. Demonstrate ability to select hardware and software components.

SECOND YEAR

UNIT IX: Introduction to Instrumentation

Competencies:

1. Identify terms associated with instrumentation.
2. Demonstrate a knowledge of job requirements.
3. Demonstrate a knowledge of the working conditions of an instrument technician.
4. Describe the factors that determine the necessity for instrumentation.
5. Demonstrate a knowledge of the history of instrumentation.
6. Demonstrate a knowledge of career opportunities.
7. Identify the various types of instrumentations systems.
8. Identify the applications of various types of instrumentation systems.
9. Demonstrate a knowledge of codes, standards, and regulations.
10. Identify safety hazards associated with the instrumentation industry.
11. Demonstrate a knowledge of the various trade publications available to the instrument technician.
12. Demonstrate a knowledge of the various trade professional organizations available to the instrument technician.

UNIT X: Fundamentals of Measurement

Competencies:

1. Identify terms associated with pressure measurement.
2. Describe the principles and operation of Bourdon tube, piezoelectric, crystal, strain gauge, bellows, diaphragm, and manometer measuring devices.
3. Demonstrate a knowledge of pressure measurement units and their conversion factors.
4. Perform pressure measurements and conversions.
5. Identify terms associated with temperature measurement.
6. Describe the principles and operation of thermocouples, resistance-temperature differential (RTD), thermistor, gas-vapor-liquid, Bourdon, and bimetal element temperature measuring devices.
7. Demonstrate a knowledge of temperature measurement units and their conversion factors.
8. Perform temperature measurements and conversions.
9. Identify terms associated with flow.
10. Describe the principles and operation of orifice plate, weir, pitot tube, magnetic, turbine, variable area, and vortex flow meters.
11. Demonstrate a knowledge of flow measurement units and their conversion factors.
12. Perform flow measurements and conversions.
13. Identify terms associated with level measurement.
14. Describe the principles and operation of float, bubble tube, conductivity, radiation, sight glass, differential pressure, ultrasonic, tape and float, and interface level measuring devices.
15. Demonstrate a knowledge of level measurement units and their conversion factors.
16. Perform level measurements and conversions.
17. Identify terms associated with analytical measuring instruments.
18. Describe the principles and operation of oxygen reduction potential (ORP), pH, conductivity and infrared analytical measuring devices.
19. Demonstrate a knowledge of analytical measurement units and their conversion factors.
20. Perform analytical measurements and conversions.

UNIT XI: Tools and Materials

Competencies:

1. Identify various types of hand tools.
2. Identify various types of power tools.
3. Use hand and power tools.
4. Identify various types of tubing.

5. Identify various types of fittings.
6. Identify various types of pipe.
7. Demonstrate the ability to connect tubing/piping assemblies to meet industry standards.
8. Identify various types of electrical conduit.
9. Cut and bend electrical conduit.
10. Identify various types of cables, lugs, splices, and terminations.
11. Perform splicing and termination procedures.
12. Identify safety hazards associated with tools and their use.
13. Apply safety practices.

UNIT XII: Documentation

Competencies:

1. Identify terms associated with documentation.
2. Identify various types of documents, such as piping and instrument drawings (P & ID), flow sheets, loop sheets, specification sheets, cable and wire lists, electrical one-line diagrams, logic diagrams, and schematics.
3. Identify Instrument Society of America (ISA) standard instrument symbols.
4. Identify various types of symbols such as American National Standards Institute (ANSI), National Electrical Code (NEC), American Petroleum Institute (API), and piping symbols.
5. Read and interpret documents.
6. Demonstrate the ability to sketch.
7. Complete documents associated with job scope such as: work orders, calibration records, daily reports, purchase requisitions, lock-out and tag-out forms, accident reports, and equipment history reports.

UNIT XIII: Test Equipment

Competencies:

1. Identify terms associated with test equipment.
2. Identify various types of test equipment.
3. Demonstrate the ability to use high accuracy pressure calibrator, deadweight tester, temperature bath, input-output simulator, bulb calibrator, and vacuum pump test equipment.
4. Demonstrate the ability to use pneumatic test equipment.
5. Demonstrate a knowledge of pneumatic test equipment calibration requirements.
6. Identify various types of electrical test equipment.
7. Demonstrate the ability to use electrical test equipment.
8. Identify safety hazards associated with test equipment use.
9. Apply safety practices.

UNIT XIV: Final Control Elements

Competencies:

1. Identify terms associated with final control elements.
2. Identify various types of final control elements.
3. Describe function of final control elements.
4. Identify the components of various final control elements.
5. Describe the operation of air-operated control valves.
6. Describe the operation of motor-operated control valves.
7. Describe the operation of hydraulic-operated control valves.
8. Identify control valve characteristics.
9. Disassemble control valves.
10. Inspect control valves.
11. Repair control valves.
12. Pack control valves.
13. Stroke control valves.

14. Identify safety hazards associated with final control elements.
15. Apply safety practices.
16. Identify various types of actuators and positioners.
17. Describe the function of actuators and positioners.
18. Identify the applications of actuators and positioners.

UNIT XV: Air Systems

Competencies:

1. Identify terms associated with air systems.
2. Identify components of air systems—regulators, filters, driers, air compressors, pressure release safety valves, and headers.
3. Describe the purpose of the various components of an air system.
4. Describe the applications of air systems.
5. Draw a block diagram of an air distribution system.
6. Identify safety hazards associated with air systems.
7. Apply safety practices.

UNIT XVI: Gauges, Indicators, and Recorders

Competencies:

1. Identify terms associated with gauges, indicators, and recorders.
2. Identify the various types of gauges, indicators, and recorders.
3. Identify the applications of various gauges, indicators, and recorders.
4. Describe the function of various gauges, indicators, and recorders.
5. Demonstrate a knowledge of the mechanics associated with gauges, indicators, and recorders.
6. Calibrate gauges, indicators, and recorders.
7. Troubleshoot gauges, indicators, and recorders.
8. Repair gauges, indicators, and recorders.
9. Identify the safety hazards associated with gauges, indicators, and recorders.
10. Apply safety practices.

UNIT XVII: Transmitters, Transducers, and Computing Relays

Competencies:

1. Identify terms associated with transmitters, transducers, and computing relays.
2. Identify the various types of transmitters.
3. Identify the applications of the various types of transmitters, transducers, and computing relays.
4. Describe the function and operation of temperature, mechanical, millivolt-pressure, millivolt-mechanical, differential pressure, remote-sealed, bubble tube, level, D/P, ultrasonic, radiation, conductivity, and integrator and telemetry transmitters.
5. Describe the function and operation of manual pressure and set-point station transducers.
6. Describe the function and operation of computing relays.
7. Calibrate a transmitter.
8. Troubleshoot transmitter problems.
9. Repair transmitters.
10. Identify safety hazards associated with transmitters, transducers, and computing relays.
11. Apply safety practices.

UNIT XVIII: Programmable Logic Controllers

Competencies:

1. Identify terms associated with programmable logic controllers.
2. Identify various types of programmable logic controllers.
3. Identify the applications of programmable logic controllers.
4. Describe the function and operation of a programmable logic controller.
5. Program a programmable logic controller.
6. Read and interpret a programmable logic controller documentation.

7. Implement a change in a programmable logic controller program.
8. Troubleshoot a programmable logic controller.

UNIT XIX: Introduction to Control Systems

Competencies:
1. Identify terms associated with control systems.
2. Identify the various types of control systems.
3. Identify the various applications of control systems.
4. Describe the functional characteristics of control systems.

UNIT XX: Alarms

Competencies:
1. Identify terms associated with alarms.
2. Identify the various types of alarm systems.
3. Identify the applications of various types of alarm systems.
4. Describe the function and operation of annunciators, analog, and digital alarms.
5. Troubleshoot alarm systems.

UNIT XXI: Control Loops

Competencies:
1. Identify terms associated with control loops.
2. Identify the various types of control loops.
3. Identify the various applications of control loops.
4. Describe the function and operation of proportional, proportional and reset, proportional-reset-derivative, feedback, feed forward, cascade, and set-point limiting control loops.
5. Construct a control loop.
6. Troubleshoot a control loop.
7. Align and tune a control loop.

UNIT XXII: Logic

Competencies:
1. Identify terms associated with logic.
2. Identify the various types of logic.
3. Identify the various applications of logic.
4. Describe the functional characteristics of permissive, step sequence, interlock, truth table, valve position feedback, and motor interlock logic.
5. Troubleshoot logic applications.

UNIT XXIII: Data Acquisition

Competencies:
1. Identify terms associated with data acquisition.
2. Identify the various data acquisition methods.
3. Identify the various applications of data acquisition.
4. Describe the functional characteristics of sampling, data storage, and trending.
5. Collect and interpret data obtained through the application of various data acquisition devices.

UNIT XXIV: Signal Conditioning

Competencies:
1. Identify terms associated with signal conditioning.
2. Identify the various types of signal conditioning.
3. Identify the applications of various types of signal conditioning.
4. Describe the function of zero elevation, zero suppression, square-root, function generator, dynamic compensator, signal limiting, and Summer's signal conditioning.
5. Construct a control loop using signal conditioning.
6. Align a control loop.
7. Tune a control loop.

UNIT XXV: Computing Functions

Competencies:

1. Identify terms associated with computing functions.
2. Identify the various types of computing functions.
3. Identify the applications of computing functions.
4. Load a system.
5. Demonstrate the use of an operating system.
6. Demonstrate the use of operating system utilities.

UNIT XXVI: Introduction to Nuclear Instrumentation

Competencies:

1. Identify terms associated with nuclear instrumentation.
2. Identify the various types of nuclear detection instrumentation.
3. Identify the various types of nuclear detection systems.
4. Describe the function and operation of scintillation detectors, Geiger-Mueller detectors, digital radiation monitors, and nuclear instrumentation systems.

UNIT XXVII: Human Relations

Competencies:

1. Identify terms associated with human relations.
2. Demonstrate a willingness to learn.
3. Demonstrate a professional attitude.
4. Demonstrate the ability to be a good listener.
5. Demonstrate the ability to follow oral and written instructions.
6. Demonstrate the ability to communicate instructions accurately and effectively.
7. Demonstrate high reliability in the performance of duties.
8. Demonstrate problem-solving skills.
9. Demonstrate punctuality.
10. Exhibit pride and loyalty.
11. Comply with safety and health rules.
12. Demonstrate personal hygiene and cleanliness.
13. Show empathy, respect, and support for others.
14. Write legibly.

UNIT XXVIII: Job Seeking Skills

Competencies:

1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.
5. Write a letter of application.
6. Complete a job application.
7. Participate in a mock interview.
8. Write a follow-up letter.
9. Conduct a job search.
10. Write a letter of resignation.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Trade and Industrial **Course Title:** Jewelry Technology

CIP Code: 48.0602 **Course Length** 2025 Clock Hours - 18 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical shop experience to prepare students for employment in the field of Jewelry Technology or to provide supplemental training for persons previously or currently employed in Jewelry Technology.

The course prepares individuals to design, fabricate, and repair jewelry articles such as rings, broaches, pendants, bracelets, and lockets. It includes instruction in modelmaking; casting, engraving, polishing, stonesetting, fitting rings, and soldering broken parts; reshaping and restyling old jewelry; and using special jeweler's hand tools and machines.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The course content is organized into competency-based units of instruction that specify occupational competencies which the student must successfully complete.

Units of Instruction: *Section A—Jewelry Repairer*

I. Orientation
II. Safety
III. Metals Used in Jewelry
IV. Sawing and Filing
V. Annealing and Hardening Metals
VI. Soft Solder and Soldering
VII. Polishing and Buffing
VIII. Cleaning
IX. Hard Soldering With Silver
X. Pickling
XI. Hard Soldering With Gold
XII. Chemical Coloring
XIII. Surface Textures and Finishes on Brass, Silver, and Gold Metals
XIV. General Jewelry Repair
XV. Hard Soldering and Welding With Platinum
XVI. Job Seeking Skills

Section B—Gemstone and Diamond Setter

I. Gemstones
II. Gemstone Setting
III. Cultured Pearl Setting and Stringing
IV. Diamond Setting
V. Advanced Study of Synthetic and Natural Gemstones
VI. General Gemstone Setting

Section C—Custom Jewelry Manufacturer

I. Rolling Mill
II. Wire Drawing and Tube Making
III. Jewelry Design
IV. Electroplating

Units of Instruction: (continued)

V. Engraving
VI. Refining and Alloying Metals Used in Jewelry
VII. Wax Working
VIII. Casting
IX. Experimenting With New Ideas in Surface Texture and Finishes
X. Mold Making

Curriculum Competency Outline

Section A—Jewelry Repairer

UNIT I: Orientation

Competencies:

1. Demonstrate a knowledge of the jewelry crafts industry.
2. Identify advantages and disadvantages of a jewelry trade including the following: seasonal work hours requirements, meticulous and tedious tasks, requested deadlines, and job availability and satisfaction.
3. Describe factors affecting human relations.
4. Discuss customer relations.
5. Demonstrate good attitudes and good work habits to include the following: self-discipline, self-motivation, appearance, and work ethics.
6. Discuss polygraph role in job placement.
7. Identify methods of purchasing tools and materials.

UNIT II: Safety

Competencies:

1. Identify shop safety hazards including: chemicals, power tools, and hand tools.
2. Demonstrate proper safety practices.
3. Apply basic first-aid techniques.

UNIT III: Metals Used in Jewelry

Competencies:

1. Identify precious and nonprecious metals.
2. Perform tests on different silver alloys.
3. Perform tests on gold of different karats.
4. Identify unknown metals by testing.

UNIT IV: Sawing and Filing

Competencies:

1. Identify types and uses of files and saws.
2. Saw and file a straight line using brass, copper, white metal, and steel.
3. Saw and file a straight line using silver.
4. Saw and file a straight line using gold.
5. Saw and file a curved line using brass, copper, white metal, and steel.
6. Saw and file a curved line using silver.
7. Saw and file a curved line using gold.
8. Saw and file a circle using brass, copper, white metal, and steel.
9. Saw and file a circle using silver.
10. Saw and file a circle using gold.
11. Saw and file a square using brass, copper, white metal, and steel.
12. Saw and file a square using silver.
13. Saw and file a square using gold.
14. Saw and file a free-form line using brass, copper, white metal, and steel.

15. Saw and file a free-form line using silver.
16. Saw and file a free-form line using gold.
17. Saw and file a triangle using brass, copper, white metal, and steel.
18. Saw and file a triangle using silver.
19. Saw and file a triangle using gold.

UNIT V: Annealing and Hardening Metals

Competencies:
1. Identify methods of annealing and hardening metals.
2. Anneal gold.
3. Harden gold.
4. Anneal silver.
5. Harden silver.
6. Anneal steel.
7. Harden steel.
8. Temper steel.
9. Prepare gravers.
10. Make a burnisher.

UNIT VI.: Soft Solder and Soldering

Competencies:
1. Identify fluxes, solders and heating devices.
2. Prepare metals for soldering.
3. Solder flat pieces of brass.
4. Solder round wire on flat surface.
5. Solder round wire together.
6. Sweat solder.
7. Repair costume jewelry.
8. Make a brass box.
9. Cut and solder brass ring.

UNIT VII: Polishing and Buffing

Competencies:
1. Identify compounds, equipment, and methods of polishing jewelry.
2. Polish and buff flat pieces, rings, and jump rings of brass.
3. Polish and buff flat pieces, rings, and jump rings of copper.
4. Polish and buff sterling silver rings.
5. Polish and buff gold rings.
6. Polish and buff stainless steel watch cases.
7. Polish and buff gold and gold-filled watch cases.
8. Trum (string polish) pierced jewelry.
9. Lap brass and silver flat surfaces.
10. Polish and buff miscellaneous jewelry objects.
11. Polish gold and silver by using vibrating tumbler.

UNIT VIII: Cleaning

Competencies:
1. Identify cleaning methods, solutions, and cleaning equipment.
2. Clean jewelry by using the ultrasonic method.
3. Clean jewelry by using the steam method.

UNIT IX: Hard Soldering With Silver

Competencies:
1. Identify types and uses of silver solders.
2. Prepare silver flat stock for soldering by cleaning/buffing.
3. Prepare silver solder.

UNIT IV: Electroplating

Competencies:
1. Define the working principles of electroplating.
2. Apply copper plate to articles.
3. Apply nickel plate to brass or copper plates.
4. Apply silver plate to brass plates.
5. Apply gold plate to plates and rings.
6. Apply rhodium plate to white gold rings.
7. Apply gold plating and rhodium plating to rings using two-tone plating method.

UNIT V: Engraving

Competencies:
1. Identify types of gravers and blocks for hand engraving.
2. Draw styles of lettering on paper.
3. Lay out on practice plate.
4. Prepare hand tools.
5. Transfer design to a plate to be engraved.
6. Cut script lettering.
7. Cut block lettering.
8. Cut designs and letters on jewelry.
9. Demonstrate use of engraving machine.
10. Engrave letters on brass plate using machine.

UNIT VI: Refining and Alloying Metals Used in Jewelry

Competencies:
1. Define metals used in jewelry making.
2. Describe safe use of chemicals and acids.
3. Reclaim gold by refining with aqua regia.
4. Reclaim yellow gold with nitric acid.
5. Reclaim silver with nitric acid.
6. Refine gold and silver filings.
7. Alloy metals.

UNIT VII: Wax Working

Competencies:
1. Identify types of waxes used in jewelry making.
2. Inject wax into rubber molds.
3. Clean wax patterns.
4. Alter wax patterns.
5. Make ring pattern using File-A-Wax.
6. Work with build-up waxes.
7. Use stickey wax.
8. Use water-soluble wax.
9. Construct pendant or ring using wax pen.
10. Construct basket setting using wax wires.
11. Make texture finishes on wax rings using wax-working tools.
12. Carve waxes.
13. Perform general pattern-making and wax-forming techniques.
14. Construct a simple pin or broach.
15. Construct a pendant.
16. Construct a ring.
17. Construct a buckle.
18. Construct an abstract piece of jewelry.

UNIT XII: Chemical Coloring

Competencies:

1. Identify chemicals used for coloring metals.
2. Mix chemical coloring (liver of sulphur) solutions for sterling silver.
3. Antique finish sterling silver objects.
4. Antique finish gold jewelry objects.
5. Obtain French gray finish on sterling silver jewelry.
6. Refinish worn-off color on costume jewelry.

UNIT XIII: Surface Textures and Finishes on Brass, Silver, and Gold Metals

Competencies:

1. Identify types of surface textures and finishes.
2. Identify tools and their uses.
3. Apply satin finish to rings using hand and machine tools.
4. Apply Florentine finish to ring heads using graver and file.
5. Apply Florentine finish around stone set in charm using graver.
6. Apply Florentine finish to flat pieces of silver and gold.
7. Apply Florentine finish to curved pieces of silver and gold.
8. Apply bark finish to rings using flex shaft.
9. Apply antique finish to white and yellow gold rings.
10. Practice general surface and head finishing using above methods.

UNIT XIV: General Jewelry Repair

Competencies:

1. Determine repairs needed.
2. Determine procedures to perform repairs.
3. Fill out a jewelry repair envelope.
4. Perform general repair on fine jewelry for staff and students.

UNIT XV: Hard Soldering and Welding With Platinum

Competencies:

1. Identify properties and characteristics of platinum and palladium.
2. Clean and prepare platinum ring for soldering.
3. Size man's platinum ring using hard, medium, and easy-flow solders.
4. Size lady's platinum ring using hard, medium, and easy-flow solders.
5. Construct a platinum basket setting using multi-soldering techniques.
6. Retip worn prongs using platinum wire.

UNIT XVI: Job Seeking Skills

Competencies:

1. Search for job openings.
2. Establish physical and written portfolio.
3. Prepare a personal resume'.
4. Fill out a job application.
5. Prepare a letter of application.
6. Prepare a follow-up letter.
7. Participate in a mock job interview.

Section B—Gemstone and Diamond Setter

UNIT I: Gemstones

Competencies:

1. Identify types of gemstones.
2. Identify testing equipment.
3. Test gemstones for hardness using hardness testing points on rough crystals.
4. Test gemstones for specific gravity.
5. Test gemstones for refractive index.
6. Test gemstones for chromatic dispersion and pleochroism.
7. Check gemstones for inclusions using gem scope.
8. Identify synthetic and natural gemstones.
9. Identify grading of gemstones.

UNIT II: Gemstone Setting

Competencies:

1. Identify gemstone setting tools and their uses.
2. Prepare stone setting gravers.
3. Prepare carving tools.
4. Practice bright cut carving on copper plate.
5. Practice metal raising for forming bead.
6. Form beads of various sizes.
7. Demonstrate correct uses of flexible shaft.
8. Form stone seats with different size burrs.
9. Practice forming milgrain on copper plates.
10. Bead-set stones and carve head on copper.
11. Practice forming prongs on flat copper metal with flat graver.
12. Prong set stones in practice plate.
13. Practice cutting bearing with Hart burr in sterling silver.
14. Practice cutting star setting in sterling silver.
15. Set stones using star setting method in sterling silver.
16. Set various shapes and sizes of stones.
17. Identify compounds, equipment, and methods of polishing using sterling silver.
18. Prepare prong settings.
19. Solder prong settings onto ring shank and set stones.
20. Prepare practice settings for setting stones by Gypsy method.
21. Gypsy-set stones in practice rings.
22. Prepare Bezel settings and set stones.
23. Prepare Pave' setting on Dome rings and set stones.
24. Prepare Pinpoint setting using Hart burrs and set stones.
25. Prepare Cluster ring setting and set stones.
26. Channel-set synthetic rubies in Eternity rings.
27. Burnish-set synthetic rubies in Tube settings.
28. Hammer-set stones.
29. Practice cutting seats using flame burrs.
30. Practice cutting seats for Cab stones.
31. Set Cab stones in pendants and rings.
32. Practice setting four-prong earring mountings.
33. Practice setting six-prong earring mountings.
34. Practice setting Buttercup earring mountings.

UNIT III: Cultured Pearl Setting and Stringing

Competencies:

1. Identify types of natural, cultured, and imitation pearls.
2. Drill a hole in a cultured pearl using a flexible-shaft machine.
3. Prepare Peg setting and set cultured pearl.
4. Set cultured pearls in commercial-made pearl cups.
5. Set cultured pearls in prong settings on rings.
6. String and knot imitation pearls.
7. String and knot cultured pearls.

UNIT IV: Diamond Setting

Competencies:

1. Identify cuts and properties of diamonds.
2. Examine diamonds with gem scope or eye loupe.
3. Practice selecting proper size settings for stones.
4. Set small diamonds in four-prong setting.
5. Set diamonds in ring head using the bead-setting method.
6. Set different size stones in standard six-prong Tiffany mounting.
7. Set diamonds in Dome rings using the Star-setting method.

8. Set diamonds using the Gypsy-setting method.
9. Set stones in various Illusion settings.
10. Prepare and set seven-stone pinpoint cluster in gold ring.
11. Set stones in Fishtail setting.
12. Channel-set synthetic Baguettes in rings.
13. Channel-set Brilliant cut diamonds in rings.
14. Single-set Baguette stones in pendants.
15. Set rings with diamonds using prong-type Illusion settings.
16. Set small Brilliant cut diamonds using burnishing methods.

UNIT V: Advanced Study of Synthetic and Natural Gemstones

Competencies:
1. Test gemstones using refractometer.
2. Test for fluorescences using long-wave and short-wave light sources.
3. Identify stones using a gem scope.
4. Test and identify stones using specific gravity method.
5. Read materials about man-made stones.

UNIT VI: General Gemstone Setting

Competencies:
1. Determine type of setting needed.
2. Determine procedures to perform setting.
3. Fill out work order envelope.
4. Perform work order request.

Section C—Custom Jewelry Manufacturer

UNIT I: Rolling Mill

Competencies:
1. Demonstrate proper uses of rolling mill.
2. Prepare metal from sheet form for rolling.
3. Spring-harden gold and silver by rolling in mill.
4. Construct money clip and tie bar.
5. Change thickness and width of stock.
6. Change round wire to square wire.

UNIT II: Wire Drawing and Tube Making

Competencies:
1. Demonstrate proper uses of drawing table.
2. Prepare metal wire for drawing.
3. Reduce diameter of copper wire using draw table.
4. Prepare silver stock and roll to size to make tubing.
5. Use draw plate to form tubing.
6. Solder fabricated tubing to make seamless.

UNIT III: Jewelry Design

Competencies:
1. Identify basic techniques of designs.
2. Design simple pins or broaches.
3. Design pendants.
4. Design rings.
5. Design buckles.
6. Design abstract pieces of jewelry.

4. Practice fluxing joints.
5. Solder silver pieces.
6. Solder silver rings.
7. Size silver rings.
8. Multisolder jewelry objects by using hard, medium, and easy-flow silver solder.
9. Make large brass jump rings.
10. Make a brass chain.
11. Solder peg-head setting on plain silver band.
12. Retip worn prong on a silver ring.
13. Solder silver bails on pendants.
14. Solder silver settings on silver rings.
15. Repair silver jewelry.

UNIT X: Pickling

Competencies:

1. Identify pickling solutions and their uses.
2. Prepare pickling solution for sterling silver.
3. Pickle soldered silver objects.
4. Polish soldered silver objects.
5. Prepare pickling solutions for gold.
6. Pickle soldered gold objects.
7. Polish soldered gold objects.

UNIT XI: Hard Soldering With Gold

Competencies:

1. Identify types and uses of gold solders.
2. Size and solder brass practice rings.
3. Size, pickle, polish, and clean gold rings.
4. Replace worn yellow gold ring shanks.
5. Replace worn white gold ring shanks.
6. Replace lugs on watch cases.
7. Solder white gold shanks onto ring heads.
8. Solder yellow shanks on white heads.
9. Solder 14K four-prong settings onto jewelry.
10. Solder jump ring on charm bracelet.
11. Solder rings together.
12. Fill small dents in rings.
13. Solder and repair gold watch or key chain.
14. Solder and repair safety chain and pendant chains.
15. Identify stone characteristics and durability of stones.
16. Size rings containing stones.
17. Replace broken prongs and reset stones.
18. Replace broken pin stems and catches.
19. Retip worn prongs on gold ring.
20. Retip worn prongs on sterling silver pendant.
21. Solder peg-head setting on gold ring.
22. Replace worn illusion setting on man's ring.
23. Replace worn illusion setting on lady's ring.
24. Solder six-prong Tiffany setting on standard shank.
25. Repair broken gold chains.
26. Rebuild worn pendant bails.
27. Repair worn jump ring on charm.
28. Solder hole in the back of a watch case.
29. Replace worn out ring on gold chain.

UNIT VIII: Casting

Competencies:

1. Identify casting methods and materials.
2. Prepare wax models.
3. Prepare single sprue for wax patterns.
4. Convert wax weight to metal weight by use of mathematics.
5. Prepare investment and invest models.
6. Define burn-out furnace and its uses.
7. Burn out prepared flask.
8. Prepare metal to be cast in a mold.
9. Remove flask from furnace and cast.

UNIT IX: Experimenting With New Ideas in Surface Textures and Finishes

Competencies:

1. Apply new surface textures and finishes.
2. Apply surface textures and finishes to wax.
3. Identify new tools and their uses for surface textures and finishes.

UNIT X: Mold Making

Competencies:

1. Identify tools and materials used to make molds.
2. Solder sprue rods on items.
3. Pack mold frame with raw rubber.
4. Vulcanize a rubber mold.
5. Cut out a rubber mold.
6. Perform general rubber mold making and cutting.
7. Make cold cure molds.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education
Competency-Based Course Outline

Program Area: Trade and Industrial

Course Title: Marine Operations

CIP Code: 49.0301

Course Length 1350 Clock Hours - 12 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical hands-on experience to prepare students for employment in a variety of jobs in the field of marine operations.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The content is organized into competency-based units of instruction which specify occupational competencies which the student must successfully complete.

This course generally prepares individuals to perform tasks on fresh-water and sea-going vessels, tugboats, barges, floating structures, and related harbor and dock equipment. Includes instruction in firefighting; lifesaving; fiber and wire rope handling and splicing; hull maintenance; cargo-handling; ship handling gear and ground tackle; piloting; celestial and electronic navigation; marine laws and regulations; and watchkeeping.

This program is cooperative, meaning the trainee alternates between formal (classroom) training and on-the-job training (OJT) while employed aboard vessels, rigs, or platforms. The curriculum competency outline contained herein covers only the formal training units. The training program also includes OJT tasks contained in the appropriate OJT manuals.

The competencies contained herein were developed with representatives from the marine industry following the United States Coast guard (USCG) approved curriculum.

The Coast Guard has proposed total revision of their marine licensing regulations. When these regulations become effective, a restructuring of this curriculum may be required.

This curriculum will become effective with the revision of Part 10 of Title 46 of the Code of Federal Regulations and approval of the United States Coast Guard.

Units of Instruction:

I. Introduction to Marine Operations
II. Basic Seamanship
III. Basic Engineering
IV. Life Saving
V. First Aid
VI. Fire Fighting and Tankerman
Exit 1: Oiler (Diesel)
VII. Communications—Marine Radio and Signaling
VIII. Rules of the Road
IX. Towing
X. Cargo Operations
XI. Instruments and Accessories
XII. Piloting
XIII. Nautical Mathematics and Sketching
XIV. Vessel Construction, Repair, and Pollution Control
XV. Weather
Exit 2: Vessel Operator (200 Ton Mate)
XVI. Stability and Damage Control
XVII. Electronic Navigation Systems

XVIII. Radar
XIX. Celestial Navigation
XX. Marine Laws and Regulations
XXI. Ships Business and Management
XXII. Human Relations
XXIII. Job Seeking Skills
Final Exit: Mate (1600 Tons)

Curriculum Competency Outline

UNIT I: Introduction to Marine Operations

Competencies:
1. Identify terms associated with marine operations.
2. Demonstrate a knowledge of job requirements.
3. Demonstrate a knowledge of the unique working conditions of marine operations personnel.
4. Demonstrate a knowledge of career opportunities.
5. Demonstrate a knowledge of dress code requirements.
6. Identify unique safety hazards associated with marine operations.
7. Demonstrate a knowledge of the salaries and benefits available to members of a marine operations crew.
8. Identify the duties of the various members of the marine operations crew.
9. Identify various types and classes of vessels used in the marine industry.
10. Describe the operational differences between the various segments of the marine industry.
11. Identify licensing/code requirements for marine operations personnel.
12. Identify agencies that regulate marine operations.
13. Demonstrate a knowledge of the history of the offshore petroleum industry.
14. Demonstrate a knowledge of the processes and procedures necessary to produce oil and gas offshore.

UNIT II: Basic Seamanship

Competencies:
1. Identify terms associated with basic seamanship.
2. Identify the various classifications of seamanship.
3. Differentiate between marlinspike, deck, and boat seamanship.
4. Demonstrate the ability to tie or make various types of knots, bends, and hitches.
5. Identify deck fittings, gear, and machinery.
6. Perform deck maintenance.
7. Perform mooring procedures.
8. Perform anchoring procedures.
9. Demonstrate the ability to make up various types of tows.
10. Identify "watch-standing" duties.
11. Perform "watch-standing" duties.
12. Demonstrate the ability to execute proper radio-telephone procedures.
13. Identify various navigational aids and applications.
14. Demonstrate the ability to utilize watch, quarter, and station bill.
15. Identify basic navigational lights, shapes, and signals.
16. Demonstrate a knowledge of pollution control factors that must be considered by a basic seaman.
17. Identify safety hazards associated with basic seamanship.
18. Apply safety practices.

UNIT III: Basic Engineering

Competencies:

1. Identify terms associated with basic engineering.
2. Demonstrate a knowledge of the measurement units used in the marine industry.
3. Demonstrate a knowledge of various types of storage batteries.
4. Identify various types of hand tools.
5. Demonstrate the proper use, safety, and care of hand tools.
6. Identify various types of portable and stationary power tools.
7. Demonstrate the proper use, safety, and care of portable and stationary power tools.
8. Identify various types of measuring devices.
9. Demonstrate the proper use, safety, and care of measuring devices.
10. Identify various types of tubes/pipes and fittings.
11. Cut and thread pipe.
12. Cut, flare, and assemble tubing and fittings.
13. Inspect and report unsafe/defective tools.
14. Identify personal safety equipment.
15. Use personal safety equipment in the performance of duties.
16. Inspect and maintain personal safety equipment.
17. Perform preventive maintenance.
18. Perform start-up and shut-down procedures.
19. Identify safety hazards associated with basic engineering.
20. Apply safety practices.

UNIT IV: Life Saving

Competencies:

1. Identify terms associated with life saving and life saving techniques.
2. Identify various types of life saving gear and equipment.
3. Demonstrate the ability to use life saving gear and equipment.
4. Inspect life saving gear and equipment.
5. Maintain life saving gear and equipment.
6. Demonstrate a knowledge of abandon ship and survival techniques/procedures.
7. Demonstrate a knowledge of search and rescue (SAR) operations.
8. Perform search and rescue operations.
9. Identify safety hazards associated with life saving.
10. Apply safety practices.

UNIT V: First Aid

Competencies:

1. Identify terms associated with first aid.
2. Demonstrate the ability to perform multi-media first aid.
3. Demonstrate the ability to perform cardiopulmonary resuscitation (CPR) techniques.
4. Obtain and maintain Red Cross/American Heart Association certification in multi-media/cardiopulmonary resuscitation (CPR) techniques.
5. Demonstrate a knowledge of the International Medical Code (I.M.C.) and its applications.

UNIT VI: Fire Fighting and Tankerman

Competencies:

1. Identify terms associated with fire fighting and tankerman.
2. Identify fire types and classes.
3. Identify the parts of a fire.
4. Identify various types of fire extinguishers and their applications.
5. Demonstrate the ability to prevent and extinguish fires.
6. Demonstrate the ability to safely handle combustible and inflammable cargo.
7. Identify various types of general, marine, and industrial safety equipment.

8. Demonstrate the ability to use general, marine, and industrial safety equipment.
9. Maintain general, marine, and industrial safety equipment.
10. Identify breathing apparatus equipment and component parts.
11. Demonstrate the ability to use breathing apparatus.
12. Inspect and maintain breathing apparatus.
13. Demonstrate the ability to read and interpret chemical product data sheets and apply recommended handling and storage procedures to cargo being shipped.
14. Demonstrate a knowledge of the laws and regulations governing marine safety.
15. Identify safety hazards associated with fire fighting and tankerman duties.
16. Apply safety practices.

First Exit Point: Oiler (Diesel)

UNIT VII: Communications—Marine Radio and Signaling

Competencies:

1. Identify terms associated with marine radio communications and signaling.
2. Demonstrate a knowledge of the various methods of marine communications.
3. Demonstrate a knowledge of licensing agencies and licensing requirements.
4. Obtain a Federal Communications Commission (FCC) Marine Operators Permit.
5. Demonstrate the ability to read flashing light signals.

UNIT VIII: Rules of the Road

Competencies:

1. Identify terms associated with rules of the road.
2. Identify lights, shapes, and sound signals necessary to acquire an able-bodied (AB) seaman endorsement.
3. Identify lights, shapes, and sound signals necessary to acquire a deck license.
4. Determine stand-on/give-way vessels in various situations.
5. Determine appropriate maneuver/response as governed by rules of the road applications and interpretations.

UNIT IX: Towing

Competencies:

1. Identify terms associated with towing.
2. Identify various types of towing operations and procedures.
3. Identify various types of towing gear and equipment.
4. Identify and describe the various techniques used in anchor handling.
5. Demonstrate a knowledge of the various types of towing and salvage operations.
6. Demonstrate a knowledge of the laws and regulations governing towing and towing operations.
7. Identify safety hazards associated with towing.
8. Apply safety practices.

UNIT X: Cargo Operations

Competencies:

1. Identify terms associated with cargo operations.
2. Identify various types of cargo handling gear and equipment.
3. Demonstrate the proper use, safety, and care of cargo booms.
4. Demonstrate the proper use, safety, and care of winches.
5. Demonstrate the proper use, safety, and care of windlasses.
6. Demonstrate the ability to load, secure, and offload cargo.
7. Identify safety hazards associated with cargo operations.
8. Apply safety practices.

UNIT XI: Instruments and Accessories

Competencies:

1. Identify terms associated with instruments and navigational accessories.
2. Identify various types of instruments used in navigation.
3. Demonstrate the proper use and care of instruments used in navigation.
4. Demonstrate the proper use and care of accessories and publications used in navigation.

UNIT XII: Piloting

Competencies:

1. Identify terms associated with piloting.
2. Identify the various types of charts and chart projections used in piloting.
3. Identify chart symbols and abbreviations.
4. Apply longitude and latitude coordinates to determine location/position.
5. Determine latitude and longitude coordinates from position.
6. Determine position using dead reckoning.
7. Identify special piloting techniques.
8. Apply special piloting techniques.
9. Determine effects of wind, tides, and current on navigation in coastal waters.
10. Solve piloting problems involving running fixes and set and drift.
11. Solve piloting problems involving speed of current and direction of current.
12. Identify characteristics of aids to navigation.
13. Solve comprehensive navigation problems.

UNIT XIII: Nautical Mathematics and Sketching

Competencies:

1. Identify terms associated with basic mathematics.
2. Perform basic mathematical computations in the addition, subtraction, multiplication, and division of whole numbers.
3. Perform basic mathematical computations in the addition, subtraction, multiplication, and division of fractions, decimals and mixed numbers.
4. Determine areas.
5. Determine volumes.
6. Determine pressures.
7. Determine lengths.
8. Determine weights.
9. Determine velocities.
10. Perform speed, distance, and time computations.
11. Identify United States Standard Units of Measurement.
12. Identify International/Metric Standard Units of Measurement.
13. Identify symbols and abbreviations found on blueprints.
14. Read and interpret blueprints.
15. Demonstrate the ability to perform sketching operations.

UNIT XIV: Vessel Construction, Repair, and Pollution Control

Competencies:

1. Identify terms associated with vessel construction, repair, and pollution control.
2. Identify the various components that comprise vessel structure.
3. Identify agencies that issue regulations governing pollution—prevention, containment, and clean-up operations.
4. Demonstrate a knowledge of pollution laws, regulations, and penalties for violations.
5. Demonstrate a knowledge of pollution prevention, containment, and clean-up procedures.
6. Demonstrate a knowledge of Navigation and Vessel Inspection Circular (NVIC) No. 7-68 United States Coast Guard (USCG) repair guidelines.
7. Identify safety hazards associated with pollution.
8. Apply safety practices.

UNIT XV: Weather

Competencies:

1. Identify terms associated with weather.
2. Identify various types of weather conditions and their characteristics.
3. Identify the effects of winds, tides, and currents on marine operations.
4. Identify the factors that affect world weather conditions and patterns.
5. Identify the various types of instruments used to gather marine weather forecasting data.
6. Demonstrate the ability to use various types of instruments to gather marine weather forecasting data.
7. Identify safety hazards associated with weather.

Second Exit Point: Vessel Operator (200 Ton Mate)

UNIT XVI: Stability and Damage Control

Competencies:

1. Identify terms associated with stability and damage control.
2. Identify the factors that affect vessel stability.
3. Demonstrate a knowledge of the purpose and function of a vessel stability letter/booket.
4. Demonstrate the ability to apply information contained in a vessel stability letter/booklet.
5. Demonstrate a knowledge of the interrelationship between stability and damage control.
6. Identify various damage control techniques.
7. Demonstrate the ability to apply various damage control techniques.
8. Evaluate damage and determine appropriate damage control techniques.
9. Identify safety hazards associated with stability and damage control.
10. Apply safety practices.

UNIT XVII: Electronic Navigation Systems

Competencies:

1. Identify terms associated with electronic navigation.
2. Identify various types of electronic navigation systems.
3. Describe the operation of various types of electronic navigation systems.
4. Solve problems using various types of electronic navigation systems.

UNIT XVIII: Radar

Competencies:

1. Identify terms associated with radar.
2. Identify basic components and controls.
3. Demonstrate the ability to start up and adjust radar unit.
4. Demonstrate operational utilization of radar unit.
5. Demonstrate proficiency using radar in performing vessel maneuvers and collision avoidance.
6. Identify regulatory agency governing the use and certification of radar operations permit.
7. Obtain Radar Observers Permit.

UNIT XIX: Celestial Navigation

Competencies:

1. Identify terms associated with celestial navigation.
2. Identify equipment used in performing celestial navigation techniques.
3. Identify factors affecting celestial navigation.
4. Identify stars and constellations.
5. Calculate Greenwich Meridian Time (GMT).
6. Calculate Local Apparent Noon (LAN) time.

7. Calculate Local Hour Angle (LHA).
8. Calculate Sunrise-Sunset times.
9. Take sextant readings and determine running fix using sun lines.
10. Take sextant readings and determine position by three (3) star fix.
11. Take sextant readings and determine latitude by meridian passage of the sun.
12. Take sextant readings and determine variation by Local Apparent Noon (LAN).
13. Convert chronometer to Greenwich Meridian Time (GMT).
14. Take sextant readings and determine latitude and gyro error by Polaris.
15. Take sextant readings and determine gyro and magnetic compass error by azimuth.
16. Take sextant readings and determine amplitude of the sun.
17. Take sextant readings and determine Local Apparent Noon (LAN).
18. Take sextant readings and determine sunrise and sunset.
19. Take sextant readings and apply Double Second Difference (DSD) correction to computed altitude (Hc).
20. Take sextant readings and determine position using moon and planets.
21. Make sextant corrections.

UNIT XX: Marine Laws and Regulations

Competencies:
1. Identify terms associated with marine laws and regulations.
2. Identify sources of marine laws and regulations governing marine operations.
3. Demonstrate the ability to use the Code of Federal Regulations as it applies to marine operations.

UNIT XXI: Ships Business and Management

Competencies:
1. Identify terms associated with ships business and management.
2. Identify the various types of documents required for ships business operations.
3. Demonstrate the ability to complete accurately all required ship business forms and documents.
4. Demonstrate the ability to plan, organize, direct, and control available ship and personnel resources.

UNIT XXII: Human Relations

Competencies:
1. Identify terms associated with human relations.
2. Demonstrate a willingness to learn.
3. Demonstrate a professional attitude.
4. Demonstrate the ability to be a good listener.
5. Demonstrate the ability to follow oral and written instructions.
6. Demonstrate the ability to communicate instructions accurately and effectively.
7. Demonstrate high reliability in the performance of duties.
8. Demonstrate problem-solving skills.
9. Demonstrate punctuality.
10. Exhibit pride and loyalty.
11. Comply with safety and health rules.
12. Demonstrate personal hygiene and cleanliness.
13. Show empathy, respect, and support for others.
14. Write legibly.

UNIT XXIII: Job Seeking Skills

Competencies:
1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.

5. Write a letter of application.
6. Complete a job application.
7. Participate in a mock interview.
8. Write a follow-up letter.
9. Conduct a job search.
10. Write a letter of resignation.

Final Exit Point: Mate (1600 Tons)

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Trade and Industrial

Course Title: Masonry

CIP Code: 46.0102

Course Length 1800 Clock Hours - 16 Months

Course Description:

The purpose of this course is to prepare individuals to lay brick, block, and stone in the construction or repair of walls, partitions, paving, arches, foundations, fireplaces, and chimneys. This includes layout, spacing, alignment, estimating, bonding, cutting, and shaping of brick, block, and stone.

The course content is organized into competency-based units of instruction that specify occupational competencies which the student must successfully complete.

Units of Instruction:

I. Introduction to Masonry
II. Masonry Tools and Equipment
III. Mortar and Bonding
IV. Laying Brick and Tile
V. Laying Concrete Block
VI. Piers, Pilasters and Chases
VII. Chimneys and Fireplaces
VIII. Pavements and Panel Walls
IX. Cleaning Masonry Work
X. Job Seeking Skills

Curriculum Competency Outline

UNIT I: Introduction to Masonry

Competencies:

1. Describe the history of masonry.
2. Identify safety practices on the job.
3. Identify structural clay products.
4. Estimate brick masonry by rule of thumb method.
5. Estimate materials for a masonry project.
6. Identify concrete masonry units.
7. Estimate materials for a concrete block project.
8. Solve basic mathematical problems.

UNIT II: Masonry Tools and Equipment

Competencies:

1. Identify masonry tools.
2. Demonstrate safe and correct use of tools.
3. Demonstrate proper care of tools.
4. Read a rule and make measurements.
5. Identify masonry equipment.
6. Demonstrate safe and correct use of equipment.
7. Demonstrate proper care of equipment.

UNIT III: Mortar and Bonding

Competencies:
1. Identify proper mortar mix proportions.
2. Mix mortar by hand.
3. Mix mortar with mortar mixer.
4. Identify mortar problems.
5. Spread mortar.
6. Identify types of bonding.
7. Perform dry bonding and lay brick.

UNIT IV: Laying Brick and Tile

Competencies:
1. Identify procedure for laying brick walls and corners.
2. Construct a story pole.
3. Lay bricks to a line.
4. Lay bricks using a plumb rule.
5. Construct a four inch brick wall in running bond.
6. Construct a four inch rack back lead.
7. Construct an outside brick corner.
8. Construct a brick corner and build a wall.
9. Construct an eight inch brick wall.
10. Construct an eight inch brick corner return with metal ties.
11. Finish brick work by striking or raking joints.
12. Construct eight inch intersecting walls with metal ties.
13. Construct a ten inch brick cavity wall.
14. Construct masonry bonded hollow wall.
15. Construct a twelve inch brick wall.
16. Construct a reinforced brick masonry lintel.
17. Construct a three course corbel on a twelve inch wall.
18. Construct a brick veneer wall with a door and window opening.
19. Construct steps using brick masonry units.
20. Construct semicircular steps using brick masonry units.
21. Restore old brick structure.
22. Use door anchors.

UNIT V: Laying Concrete Block

Competencies:
1. Identify procedure for laying concrete block wall and corners.
2. Apply mortar and lay concrete block.
3. Construct an 8″ x 8″ x 16″ concrete block corner.
4. Construct an 8″ x 8″ x 16″ concrete block wall with wire reinforcement.
5. Apply waterproofing to concrete block wall.
6. Lay a brick face on a concrete block wall.
7. Construct an 8″ x 8″ x 16″ concrete block wall with a rowlock brick window sill.
8. Construct intersecting 8″ x 8″ x 16″ and 6″ x 8″ x 16″ concrete block walls with wire mesh every two courses.
9. Construct scaffolding.
10. Demonstrate proper and safe use of rigging.

UNIT VI: Piers, Pilasters and Chases

Competencies:
1. Construct hollow brick piers.
2. Construct an 8″ metal tied wall with two 4″ x 12″ pilasters.
3. Construct pipe chases.
4. Construct a bonded water table.
5. Construct a battered face and side pilaster.
6. Construct a solid brick pier with bond stones.
7. Construct a quoined block corner.
8. Construct a brick pier on concrete blocks.

UNIT VII: Chimneys and Fireplaces

Competencies:

1. Build a brick fireplace with a firebrick lining.
2. Build a brick fireplace with a steel fireplace unit.
3. Build a one-flue chimney with a precast cap.
4. Install synthetic stone veneer or quarry stone on the front facing of a fireplace.
5. Interpret symbols on a blueprint.
6. Interpret scales on a blueprint.
7. Interpret dimensions on a blueprint.
8. Interpret notes on a blueprint.

UNIT VIII: Pavements and Panel Walls

Competencies:

1. Construct a flat bed paving.
2. Construct basket weave pattern paving.
3. Construct diagonal basket weave pattern paving.
4. Construct herringbone pattern paving.
5. Construct basket weave pattern in a panel wall.
6. Construct a brick miter in a panel wall.
7. Construct a stone wall.
8. Construct a ceramic glazed tile wall.
9. Construct a ceramic rough tile wall.

UNIT IX: Cleaning Masonry Work

Competencies:

1. Clean a brick wall.
2. Clean a concrete block wall.
3. Demonstrate proper and safe handling and storage of acid and bleach.

UNIT X: Job Seeking Skills

Competencies:

1. Select means of locating job openings.
2. Prepare a resume'.
3. Write a letter of application.
4. Complete an employment application.
5. Participate in a mock interview.
6. Write a follow-up letter.
7. Make a follow-up phone call.
8. Evaluate a job offer.
9. Compare job opportunities.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Trade and Industrial

Course Title: Meat Processing

CIP Code: 48.0402

Course Length 1013 Clock Hours - 9 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical experience to prepare individuals for employment in the slaughtering and meat cutting industry. The course provides instruction in preparing carcasses for wholesale, retail or food-service establishments. It includes instruction in stunning; slaughtering; cutting wholesale and retail cuts of meats; sanitation; use of tools and equipment; identification of and cutting techniques for different cuts of meats; counter display; packaging; refrigeration of meats, poultry and seafood; and weighing meat. The course includes, but is not limited to, communication skills, leadership skills, human relation and employability skills, and safe and efficient work practices. The content is organized into competency-based units of instruction which specify occupational competencies the individual must successfully complete.

Units of Instruction:

I. Occupational Introduction
II. Safety and Equipment
III. Sanitation
IV. Slaughtering Beef
V. Slaughtering Pork
VI. Slaughtering Lamb
VII. Ground and Chopped Meats
VIII. Merchandising and Display
IX. Beef
X. Pork
XI. Veal
XII. Lamb
XIII. Poultry
XIV. Seafood
XV. Job Seeking Skills

Curriculum Competency Outline

UNIT I: Occupational Introduction

Competencies:

1. Describe the field of meat processing.
2. Identify working conditions involved with meat processing.
3. Identify job hazards associated with meat processing.
4. List salary and benefits associated with employment in the meat processing field.
5. Describe job opportunities available in the meat processing field.
6. Demonstrate a willingness to learn.
7. Exhibit dependability.
8. Demonstrate punctuality.
9. Follow rules and regulations.
10. Demonstrate the ability to communicate with customers in an approved manner.

11. Demonstrate personal hygiene and cleanliness.
12. Comply with safety and health rules.
13. Select correct tools and equipment.
14. Utilize equipment correctly.
15. Work productively with others.
16. Exhibit pride and loyalty.
17. Comply with dress code approved for the meat processing industry and/or company policy.

UNIT II: Safety and Equipment

Competencies:

1. Identify safety protective devices on equipment.
2. Operate a band saw.
3. Operate a slicer.
4. Operate a grinder.
5. Operate a tenderizer.
6. Operate a patty machine.
7. Maintain and use hand tools.
8. Sharpen hand tools.
9. Demonstrate proper lifting techniques.
10. Maintain a clean work area.
11. Wear personal protective clothing.
12. Wear clothing in a proper manner.
13. Demonstrate a basic knowledge of multi-media first aid.
14. Identify hand and power tools.
15. Disassemble and reassemble grinder.
16. Change blade on band saw.

UNIT III: Sanitation

Competencies:

1. Clean and sanitize all power tools.
2. Demonstrate a knowledge of proper sanitation procedures for the meat cutting industry.
3. Clean and sanitize all hand tools.
4. Clean and sanitize work area.
5. Clean and sanitize refrigerated cases.
6. Clean and sanitize coolers.
7. Clean and sanitize freezers.
8. Identify proper sanitation procedures required by state health department and company requirements.
9. Recognize and understand the meaning of state and federal inspection labels.
10. Demonstrate good personal hygiene.
11. Disconnect all electrical equipment before cleaning and sanitizing.
12. Maintain proper temperature control of refrigerated equipment to meet sanitation requirements.

UNIT IV: Slaughtering Beef

Competencies:

1. Identify equipment used in the slaughtering process.
2. Disassemble, clean, sanitize, and reassemble equipment.
3. Stun and bleed carcass.
4. Dehead, shank, and skin carcass.
5. Open, hoist and skin backside of carcass.
6. Eviscerate the carcass.
7. Split and weigh carcass.
8. Wash, shroud, and chill carcass.

UNIT V: Slaughtering Pork

Competencies:
1. Stun and bleed carcass.
2. Scald and scrape carcass.
3. Remove head, eviscerate, and split carcass.
4. Weigh and chill carcass.

UNIT VI: Slaughtering Lamb

Competencies:
1. Kosher-kill the animal.
2. Skin the carcass.
3. Open and eviscerate the carcass.
4. Wash and chill the carcass.

UNIT VII: Ground and Chopped Meats

Competencies:
1. Identify the ratio of fat content to lean content.
2. Identify types of ground and chopped meats.
3. Demonstrate a knowledge of seasonings used for ground meat products.

UNIT VIII: Merchandising and Display

Competencies:
1. Identify bad habits associated with displaying meat products.
2. Demonstrate a knowledge of meat product shelf life.
3. Perform merchandising techniques associated with package wrap, appearance and position in display case.
4. Use merchandising techniques on trimmings of meat and seafood products to increase profit margin.

UNIT IX: Beef

Competencies:
1. Identify the major portions of a beef carcass.
2. Identify primal cuts (wholesale).
3. Cut chuck.
4. Cut round.
5. Cut loin.
6. Cut rib.
7. Cut fore shank.
8. Cut brisket.
9. Cut plate (short).
10. Cut flank.
11. Identify subprimal cuts.
12. Separate chuck primal cut into blade and arm.
13. Cut blade into roast (bone-in and boneless).
14. Cut blade into steak (bone-in and boneless).
15. Cut arm into roast (bone-in and boneless).
16. Cut arm into steak (bone-in and boneless).
17. Separate loin into short loin and sirloin.
18. Cut short loin into porterhouse and T-bone steak.
19. Cut short loin into tenderloin.
20. Cut short loin into sirloin strip.
21. Cut sirloin into steaks (bone-in and boneless).
22. Separate round into rump, round, and tip.
23. Separate round into boneless rump and round.
24. Cut tip into sirloin tip roast and sirloin strip.
25. Cut round into rump roast (bone-in and boneless).
26. Cut round into round steak (bone-in and boneless).
27. Separate round into top, bottom, and eye of round.

28. Cut top, bottom and eye of round into boneless steaks and roast.
29. Cut heel of round into ground meat, boneless stew meat and cutlets.
30. Separate ribs into whole boneless ribeye.
31. Cut whole boneless ribeye into steaks.
32. Cut rib into standing rib roast.
33. Cut rib into rib steaks.
34. Bone out brisket into brisket roast.
35. Cut brisket into stew meat.
36. Cut fore shank into cross cuts for stew and soups.
37. Cut flank into a steak.
38. Bone out plate for ground meat.

UNIT X: Pork

Competencies:

1. Identify major portions of a hog.
2. Separate ham into shank and butt portions and center slice.
3. Cut boneless pork loin into butterfly pork chops and roast.
4. Cut bone-in pork loin into chops and roast.
5. Cut loin into end chops and center chops.
6. Separate shoulder and butt.
7. Cut picnic shoulder into roast and steaks.
8. Cut butt into roast and steaks.
9. Separate belly and spare ribs.
10. Trim belly for sausage and/or bacon.
11. Process offal and minor cuts.

UNIT XI: Veal

Competencies:

1. Identify major cuts of veal.
2. Cut round into thin steaks called scalloppini and/or veal cutlets.
3. Cut loin into veal sirloin and T-bone.

UNIT XII: Lamb

Competencies:

1. Identify major cuts of lamb.
2. Cut leg of lamb.
3. Cut lamb loin into chops.
4. Cut lamb rack into roast and/or chops.
5. Cut shoulder and neck into roast and steaks.
6. Cut lamb breast and shank.

UNIT XIII: Poultry

Competencies:

1. Identify major parts of a chicken.
2. Cut up whole fryer into halves, quarters, and pieces for merchandising.

UNIT XIV: Seafood

Competencies:

1. Identify major types of seafood.
2. Demonstrate a knowledge of sanitation and quality control for seafood.
3. Cut up fresh water catfish into steaks and fillets.
4. Demonstrate a knowledge of cooking techniques and procedures for seafood.
5. Season and boil crawfish.
6. Season and boil shrimp.
7. Set up display case and monitor temperature control.

UNIT XV: Job Seeking Skills

Competencies:

1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.
5. Complete a job application.
6. Participate in a mock interview.
7. Write a follow-up letter.
8. Conduct a job search.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Trade and Industrial

Course Title: Office Equipment Repair

CIP Code: 47.0102

Course Length 2250 Clock Hours - 20 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical shop experience to prepare students for employment in a variety of jobs in the field of Office Equipment Repair or to provide supplemental training for persons previously or currently employed in Office Equipment Repair.

This course generally prepares individuals to maintain and repair a variety of office machines such as typewriters, small office computers, printers, dictation machines, calculators, data processing equipment, duplication machines, mailing machines, and related office equipment. Includes instruction in diagnostic techniques, the use of testing equipment, and the principles of mechanics, electricity, and electronics as they relate to the repair of business machines.

The course emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The content is organized into competency-based units of instruction which specify occupational competencies which the student must successfully complete.

Units of Instruction:

FIRST YEAR
I. Fundamentals of Electricity/Electronics
II. Mathematics
III. Physics
IV. Fundamentals of Semiconductors
V. Basic Electronic Circuits
VI. Digital Electronics
VII. Basic Microprocessors
VIII. Computer Literacy

SECOND YEAR
IX. Typewriters, Word Processors, and Printers
X. Computers
XI. Copiers
XII. Cash Registers and Calculators
XIII. Related Office/Transcribing Equipment
XIV. Administrative Practices
XV. Customer Service and Human Relations
XVI. Job Seeking Skills

Curriculum Competency Outline

FIRST YEAR

UNIT I: Fundamentals of Electricity/Electronics

Competencies:

1. Demonstrate a knowledge of occupational job requirements, working conditions, safety hazards, pay scales, and career opportunities.
2. Identify safety hazards.
3. Demonstrate a knowledge of common safety rules and regulations.
4. Identify hand tools.
5. Demonstrate proper techniques and use of hand tools.
6. Apply correct soldering techniques.
7. Identify electrical/electronic test instruments.
8. Perform measurements using electrical/electronic test instruments.
9. Identify terms associated with electricity/electronics.
10. Identify electrical/electronic symbols.
11. Identify electrical/electronic formulas.
12. Identify electrical/electronic components.
13. Display a knowledge of atomic theory.
14. Demonstrate a knowledge of theory of ac and dc current flow.
15. Solve problems using the basic laws governing electron flow.
16. Connect electrical/electronic components in specified circuit configuration.
17. Apply safety practices.

UNIT II: Mathematics

Competencies:

1. Solve problems dealing with fractions, percentages, ratio and proportion, and powers of ten.
2. Solve problems of plane and solid geometry.
3. Solve problems using algebraic formulas.
4. Solve problems using logarithms.
5. Apply the principles in trigonometry in solving problems.
6. Solve problems using a scientific electronic calculator.

UNIT III: Physics

Competencies:

1. State the properties of matter.
2. Demonstrate the applications and effects of force, work, rate, momentum, resistance, power, potential and kinetic energy, force transformers, energy converters, transducers, vibration and waves, time constants, and radiation using mechanical energy systems.
3. Demonstrate the applications and effects of force, work, rate, momentum, resistance, power, potential and kinetic energy, force transformers, energy converters, transducers, vibration and waves, time constants, and radiation using fluidal energy systems.
4. Demonstrate the applications and effects of force, rate, resistance, power, potential and kinetic energy, force transformers, energy converters, transducers, vibration and waves, time constants, and radiation using electrical energy systems.
5. Demonstrate the applications and effects of force, work, rate, resistance, power, potential and kinetic energy, energy converters, transducers, time constants, and radiation using thermal energy systems.

UNIT IV: Fundamentals of Semiconductors

Competencies:
1. Identify terms associated with semiconductors.
2. Identify semiconductor symbols.
3. Identify semiconductor components.
4. Describe the characteristics of semiconductors.
5. Test various semiconductor devices.
6. Interpret semiconductor specification sheets.
7. Demonstrate the procedures for testing and servicing semiconductors.
8. Identify safety hazards associated with semiconductor devices.
9. Apply safety practices.

UNIT V: Basic Electronic Circuits

Competencies:
1. Identify terms associated with power supplies, amplifiers, and oscillators.
2. Identify schematic representations of power supplies, amplifiers, and oscillator circuits.
3. State the theory of operation of power supply circuits, amplifier circuits and oscillator circuits.
4. Construct and analyze various power supply circuits, amplifier circuits, and oscillator circuits.
5. Identify safety practices associated with basic electronic circuits.
6. Apply safety practices.

UNIT VI: Digital Electronics

Competencies:
1. Identify logic gate configuration.
2. Describe the truth tables associated with various logic circuits.
3. Simplify logic circuits using specified techniques.
4. Interpret integrated circuit specification sheets.
5. Identify registers, counters, multivibrators (bistable, monostable, etc.) and display devices.
6. Describe digital-to-analog and analog-to-digital techniques.
7. Analyze digital arithmetic circuits.
8. Identify safety hazards associated with digital circuits.
9. Apply safety practices.

UNIT VII: Basic Microprocessors

Competencies:
1. Identify terms associated with microprocessors.
2. Describe the basic architecture of a microprocessor.
3. Describe the basic operation of a microprocessor.
4. Demonstrate a fundamental knowledge of assembly language programming.
5. Describe system interfacing circuits and techniques.

UNIT VIII: Computer Literacy

Competencies:
1. Identify terms associated with computers.
2. Identify the impact of computers on today's society.
3. Demonstrate ability to select hardware and software components.

SECOND YEAR

UNIT IX: Typewriters, Word Processors, and Printers

Competencies:

1. Identify terms associated with typewriters, word processors, and printers.
2. Identify various types of typewriters, word processors, and printers.
3. Identify the components of typewriters, word processors, and printers.
4. Describe the operation and function of various types of typewriters, word processors, and printers.
5. Identify various type styles and fonts.
6. Identify various print methods and associated supplies.
7. Demonstrate the ability to clean, oil, and adjust (COA) typewriters and printers.
8. Demonstrate the ability to analyze, troubleshoot, and repair/replace defective components of typewriters, word processors, and printers to meet manufacturer's specifications.
9. Read and interpret parts/service manuals.
10. Read and interpret electrical diagrams/schematics.
11. Demonstrate the ability to use a typewriter.
12. Identify the safety hazards associated with typewriters, word processors, and printers.
13. Apply safety practices.

UNIT X: Computers

Competencies:

1. Identify terms associated with computer systems.
2. Identify safety hazards associated with the job.
3. Identify the different classifications of computers.
4. Identify computer applications.
5. Identify the major components of a computer system.
6. Identify terms associated with operating systems.
7. Identify the various types of operating systems.
8. Load an operating system.
9. Demonstrate the use of an operating system.
10. Demonstrate the use of operating system utilities.
11. Identify terms associated with input/output (I/O) devices.
12. Demonstrate a knowledge of system busses.
13. Use peripheral interface adapters (PIA) to perform input/output operations.
14. Use asynchronous communications interface adapters (ACIA) to perform input/output operations.
15. Demonstrate the interfacing of memory to the system buss.
16. Identify terms associated with peripherals.
17. Identify information interchange coding.
18. Identify various types of video displays.
19. Explain the use and operation of various types of video displays.
20. Identify the various types of printing devices.
21. Explain the use and operation of various types of printing devices.
22. Identify the various types of input devices.
23. Explain the use and operation of various input devices.
24. Identify the various types of data storage devices.
25. Demonstrate the use of serial RS-232 interface configurations.
26. Demonstrate the use of parallel-centronics interface configurations.
27. Identify terms associated with computer communications.
28. Describe modes of data transmission.
29. Describe the operation of modems and multiplexers/demultiplexers.
30. Describe communications protocol and software applications.
31. Use communications protocol and software.
32. Identify terms associated with troubleshooting.
33. Demonstrate a knowledge of troubleshooting techniques.

34. Execute systems diagnostics.
35. Perform service procedures.
36. Identify safety hazards associated with troubleshooting practices.
37. Apply safety practices associated with troubleshooting practices.
38. Identify terms associated with computer installation and maintenance.
39. Demonstrate a knowledge of site selection, equipment layout, and installation requirements.
40. Identify safety hazards associated with installation and maintenance practices.
41. Apply safety practices associated with installation and maintenance.
42. Perform post-maintenance equipment evaluation.

UNIT XI: Copiers

Competencies:

1. Identify terms associated with copiers.
2. Identify the various types of copiers.
3. Describe the basic steps in copier processes.
4. Differentiate between the various copier processes.
5. Demonstrate a knowledge of the operation and function of various types of copiers.
6. Identify the component parts of a copier.
7. Identify cleaning and servicing techniques.
8. Identify drum handling procedures.
9. Perform cleaning and inspection procedures.
10. Identify environmental factors that affect copier operations.
11. Demonstrate the ability to analyze, troubleshoot, and repair/replace defective components of copiers.
12. Read and interpret parts/service manuals.
13. Read and interpret electrical diagrams/schematics.
14. Identify safety hazards associated with copier servicing.
15. Apply safety practices.

UNIT XII: Cash Registers and Calculators

Competencies:

1. Identify terms associated with cash registers and calculators.
2. Identify various types of cash registers and calculators.
3. Demonstrate a knowledge of the operation and function of various types of cash registers and calculators.
4. Demonstrate a knowledge of cash register and calculator printing mechanisms.
5. Demonstrate a knowledge of cash register timing procedures.
6. Identify the components of cash registers and calculators.
7. Perform timing procedures and gear alignments.
8. Demonstrate the ability to analyze, troubleshoot, and repair/replace defective components of cash registers and calculators.
9. Demonstrate the ability to use a cash register or calculator to perform designated/specified tasks.
10. Read and interpret parts/service manuals.
11. Read and interpret electrical diagrams/schematics.
12. Identify safety hazards associated with the servicing of cash registers and calculators.
13. Apply safety practices.

UNIT XIII: Related Office/Transcribing Equipment

Competencies:

1. Identify terms associated with related office/transcribing equipment.
2. Identify various types of related office/transcribing equipment.
3. Describe the operation and function of various types of related office/transcribing equipment.
4. Identify the components of various types of related office/transcribing equipment.
5. Demonstrate a knowledge of the operation of dictation/transcribing equipment.
6. Demonstrate a knowledge of the operation of telephone equipment.

7. Demonstrate a knowledge of the operation of check protectors.
8. Demonstrate a knowledge of the operation of time clocks.
9. Demonstrate a knowledge of the operation of postal equipment.
10. Demonstrate a knowledge of the operation of fire alarm systems.
11. Demonstrate a knowledge of the operation of security systems.
12. Demonstrate a knowledge of the operation of facsimile equipment.
13. Demonstrate the ability to analyze, troubleshoot, and repair/replace defective components of related office/transcribing equipment to meet manufacturer's specifications.
14. Read and interpret parts/service manuals.
15. Read and interpret electrical diagrams/schematics.
16. Identify safety hazards associated with the servicing of related office/transcribing equipment.
17. Apply safety practices.

UNIT XIV: Administrative Practices

Competencies:

1. Identify terms associated with administrative practices.
2. Prepare service bills.
3. Maintain customer accounts and records.
4. Maintain equipment inventory and parts control.
5. Read and interpret parts and service manuals.
6. Maintain parts and service manual revisions.
7. Execute maintenance contracts and service agreements.

UNIT XV: Customer Service and Human Relations

Competencies:

1. Demonstrate the ability to speak effectively.
2. Demonstrate a willingness to learn.
3. Demonstrate a professional attitude.
4. Demonstrate the ability to be a good listener.
5. Demonstrate the ability to follow oral and written instructions.
6. Demonstrate the ability to communicate instructions accurately and effectively.
7. Demonstrate high reliability in the performance of duties.
8. Demonstrate problem-solving skills.
9. Demonstrate punctuality.
10. Exhibit pride and loyalty.
11. Comply with safety and health rules.
12. Demonstrate personal hygiene and cleanliness.
13. Show empathy, respect, and support for others.
14. Write legibly.
15. Practice good telephone etiquette.
16. Demonstrate the ability to write an effective technical report.
17. Demonstrate equipment and software operation.
18. Determine the problem and formulate a plan.
19. Perform the service.
20. Complete the transaction.

UNIT XVI: Job Seeking Skills

Competencies:

1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.
5. Write a letter of application.
6. Complete a job application.
7. Participate in a mock interview.
8. Write a follow-up letter.
9. Conduct a job search.
10. Write a letter of resignation.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education
Competency-Based Course Outline

Program Area: Trade and Industrial

Course Title: Outdoor Power Equipment Technician

CIP Code: 47.0606

Course Length 1013 Clock Hours - 9 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical hands-on experience to prepare individuals to maintain and repair outdoor power equipment such as outboard motors, lawnmowers, chainsaws, motorcycles, rotary tillers, all-terrain vehicles, portable electric generators, and small garden tractors. Communication skills, use of technical manuals, human relations and employability skills, and safe and efficient work practices are emphasized. The content is organized into competency-based units of instruction which specify occupational competencies the individual must successfully complete.

Units of Instruction:
I. Occupational Introduction
II. Safety
III. Tools and Equipment
IV. Electricity/Electronics
V. Starting Systems
VI. Charging Systems
VII. Ignition Systems
VIII. Cooling Systems
IX. Fuel Systems
X. Lubrication Systems
XI. Basic Engine Principles
XII. Pneumatic/Hydraulic Systems
XIII. Power Train
XIV. Chassis, Suspension, and Cutting Decks
XV. Brake Systems
XVI. Tires and Wheels
XVII. Basic Service
XVIII. Job Seeking Skills

Curriculum Competency Outline

UNIT I: Occupational Introduction

Competencies:
1. Describe the field of outdoor power equipment technician.
2. Identify working conditions involved with outdoor power equipment technician.
3. Identify job hazards associated with the field of outdoor power equipment technician.
4. List salary and benefits associated with employment in the outdoor power equipment technician field.
5. Describe job opportunities available for outdoor power equipment technicians.
6. Identify initial investment requirements for professional mechanics.
7. Demonstrate a willingness to learn.
8. Write legibly.

9. Listen attentively.
10. Prepare written communication.
11. Exhibit dependability.
12. Demonstrate punctuality adhering to industry standards.
13. Follow rules and regulations.
14. Read and comprehend written communication and information found in technical manuals.
15. Use technical manuals effectively.
16. Maintain clean and orderly work area.
17. Demonstrate personal hygiene and cleanliness.
18. Comply with safety and health rules.
19. Select correct tools and equipment.
20. Utilize equipment correctly.
21. Work productively with others.
22. Exhibit pride and loyalty.
23. Demonstrate problem-solving skills.
24. Show empathy, respect and support for others.
25. Wear clothing to meet safety and industrial requirements.
26. Demonstrate a knowledge of good customer relations.

UNIT II: Safety

Competencies:

1. Apply shop and equipment safety rules.
2. Identify types of fire extinguishers.
3. Locate fire extinguishers.
4. Wear safety goggles.
5. Troubleshoot electrical cords for defects.
6. Maintain safe distances around equipment in operation.
7. Observe safety regulations for operating air-powered equipment.
8. Demonstrate a knowledge of multi-media first aid.
9. Demonstrate a knowledge of braking systems on lawn equipment.

UNIT III: Tools and Equipment

Competencies:

1. Identify basic hand tools.
2. Differentiate between metric and conventional tools.
3. Select proper tool for job.
4. Use precision measuring tools.
5. Use pullers.
6. Use cylinder hones.
7. Use valve-spring compressor.
8. Use torque wrenches.
9. Use a tachometer.
10. Use a 6" scale.
11. Use a volt-ohmmeter.
12. Use reamers.
13. Use oxyacetylene equipment.
14. Use arc welding equipment.
15. Use a solder gun.
16. Use a valve seat cutter.
17. Use wire strippers.
18. Use a pedestal grinder.
19. Demonstrate a knowledge of fasteners.

UNIT IV: Electricity/Electronics

Competencies:

1. Read and interpret a wiring diagram.
2. Demonstrate a knowledge of electrical theory for alternating current and direct current.
3. Use Ohm's Law.
4. Identify components of a typical electrical system.
5. Check wire for continuity.
6. Test a switch for proper operation.
7. Test a relay for proper operation.
8. Test circuit breakers for proper operation.
9. Test a solenoid switch for proper operation.
10. Differentiate between series and parallel circuits.
11. Demonstrate a basic knowledge of electronic circuits.
12. Identify components in an electronic circuit.
13. Demonstrate transistor theory.
14. Test a diode.

UNIT V: Starting Systems

Competencies:

1. Demonstrate a knowledge of electrical starting motors.
2. Diagnose and repair electrical starting systems.
3. Diagnose and repair recoil starters.
4. Remove and replace starter brushes.
5. Remove and replace bearings in starters.
6. Remove and replace Bendix gears.
7. Remove and replace armature.
8. Remove and replace rope on recoil starter.
9. Remove and replace starter pawls.
10. Remove and replace sheaves on marine engine.
11. Remove and replace starter switch.
12. Remove and replace starter relays.
13. Remove and replace starter solenoid.
14. Remove, service and replace battery.
15. Troubleshoot starting systems.

UNIT VI: Charging Systems

Competencies:

1. Read and interpret electrical schematics.
2. Demonstrate a knowledge of charging system operation.
3. Use a digital volt-ohmmeter (VOM).
4. Test voltage drop on a battery using a VOM.
5. Check battery for specific gravity using a hydrometer.
6. Test, remove and replace a diode.
7. Describe the operation of an alternator.
8. Perform test to determine charging rate of system.
9. Charge a battery.
10. Demonstrate a knowledge of portable generator operation.
11. Test output of portable generator.
12. Troubleshoot a charging system.

UNIT VII: Ignition Systems

Competencies:

1. Demonstrate a basic knowledge of ignition system operation to include: conventional, capacitor discharge, and solid-state.
2. Remove and replace points and condenser.

3. Convert conventional ignition system to a solid-state ignition system.
4. Remove, analyze, clean, set, and replace spark plugs.
5. Test a coil for correct operation.
6. Perform test on ignition safety switches for correct operation.
7. Troubleshoot ignition circuits.
8. Read and interpret troubleshooting charts to include motorcycles and marine engines.

UNIT VIII: Cooling Systems

Competencies:

1. Demonstrate a basic knowledge of air and water cooling systems.
2. Remove and replace water pump for marine, motorcycle, and outdoor power equipment.
3. Remove and replace radiator hoses on marine, motorcycle, and outdoor power equipment.
4. Remove and replace belts on motorcycles, marine, and outdoor power equipment.
5. Remove and replace thermostats and switches on motorcycles, marine, and outdoor power equipment.
6. Remove and replace cooling shroud.
7. Clean air cooling system.
8. Pressure-test water cooling system and cap.
9. Charge water cooling system with antifreeze according to manufacturer's specifications.
10. Check antifreeze with hydrometer.
11. Drain and flush water cooling system.
12. Check belts for proper tension.
13. Inspect air cooling system flywheel for damaged or cracked cooling fins.
14. Troubleshoot cooling systems.

UNIT IX: Fuel Systems

Competencies:

1. Demonstrate a basic knowledge of carbureted fuel systems.
2. Demonstrate a basic knowledge of fuel injected systems.
3. Observe all safety rules when working with fuel and fuel systems.
4. Remove and replace fuel tanks.
5. Remove and replace fuel lines.
6. Remove and replace fuel filters.
7. Test fuel (gas) caps for proper operation.
8. Test, remove and replace mechanical and electrical fuel pumps.
9. Diagnose and analyze fuel system problems.
10. Rebuild carburetors on engines up to 12 horsepower.
11. Perform basic carburetor adjustments according to manufacturer's specifications.
12. Clean and service air filtering systems.
13. Troubleshoot fuel systems on outdoor power equipment.
14. Adjust single carburetors on motorcycles.

UNIT X: Lubrication Systems

Competencies:

1. Demonstrate a basic knowledge of four-cycle lubrication systems.
2. Demonstrate a basic knowledge of two-cycle lubrication systems.
3. Demonstrate a basic knowledge of oil injection systems for marine and motorcycle engines.
4. Drain and refill crankcase.
5. Change oil filter.
6. Check lubricant level.
7. Demonstrate a knowledge of oil classifications.
8. Lubricate a chassis and power train to manufacturer's specifications.

9. Remove and replace alemites.
10. Drain and refill lower unit on outboard motors.
11. Determine oil/fuel ratio for two-cycle engines.
12. Troubleshoot lubrication systems.

UNIT XI: Basic Engine Principles

Competencies:

1. Disassemble and reassemble a two-cycle engine to manufacturer's specifications.
2. Disassemble and reassemble a four-cycle engine to manufacturer's specifications.
3. Identify all parts of a two-cycle engine.
4. Identify all parts of a four-cycle engine.
5. Demonstrate the ability to recognize wear and defects on engine parts.
6. Differentiate between four-cycle and two-cycle engines.
7. Perform valve job.
8. Resurface valves.
9. Cut valve seats.
10. Adjust valves on motorcycles.
11. Adjust cam chains on motorcycles.

UNIT XII: Pneumatic/Hydraulic Systems

Competencies:

1. Demonstrate a basic knowledge of pneumatic and hydraulic systems.
2. Describe the operation of an outboard power trim system.

UNIT XIII: Power Train

Competencies:

1. Identify the components of a typical power train.
2. Disassemble and reassemble a lower unit on an outboard engine.
3. Disassemble and reassemble a disc drive transmission.
4. Disassemble and reassemble a Peerless transaxle.
5. Disassemble and reassemble a Peerless/Foote transmission.
6. Inspect drive sprockets for wear on ATVs, motorcycles, and outdoor power equipment.
7. Remove and replace drive sprockets and chains on ATVs, motorcycles, and outdoor power equipment.
8. Identify clutch parts on a wet clutch drive for a motorcycle.
9. Identify clutch parts on a dry clutch drive for a motorcycle.
10. Adjust clutches.

UNIT XIV: Chassis, Suspension, and Cutting Decks

Competencies:

1. Identify the major components of a motorcycle suspension system.
2. Lubricate, adjust and replace steering head bearings.
3. Lubricate, adjust and replace swing arm bearings.
4. Remove and replace front fork assembly on a motorcycle.
5. Rebuild front fork assembly.
6. Identify steering system components.
7. Remove and replace ball joints.
8. Remove and replace tie rods.
9. Inspect steering system components for wear and/or defects.
10. Demonstrate a knowledge of cutting deck operations.
11. Inspect cutting deck bearings and pulleys for wear and/or damage.
12. Remove and replace bearings and pulleys.

UNIT XV: Brake Systems

Competencies:

1. Identify the components of a typical hydraulic braking system.
2. Identify the components of a typical mechanical braking system.
3. Remove and replace brake shoes and pads.
4. Rebuild wheel cylinders.
5. Rebuild master cylinders.
6. Rebuild calipers.
7. Bleed brakes.
8. Remove, replace and adjust a flywheel braking system on lawn equipment.
9. Remove, replace and adjust a blade braking system on lawn equipment.

UNIT XVI: Tires and Wheels

Competencies:

1. Repair tube and tubeless tires.
2. Balance a wheel.
3. Remove and replace wheels on motorcycles.
4. Remove and replace wheels on all-terrain vehicles.
5. True a wheel.
6. Remove and replace wheel bearings on motorcycles.
7. Inflate tires to manufacturer's specifications.
8. Diagnose tire wear patterns on motorcycles.

UNIT XVII: Basic Service

Competencies:

1. Sharpen and balance a lawn mower blade.
2. Adjust clutches according to manufacturer's specifications.
3. Adjust throttle and shift linkages according to manufacturer's specifications.
4. Adjust governors to manufacturer's specifications.
5. Check engine RPM.
6. Adjust carburetors according to manufacturer's specifications.
7. Adjust valves.
8. Adjust brakes.
9. Adjust safety cables and controls.
10. Adjust cutting deck level.
11. Adjust drive belts.
12. Remove and replace belts.

UNIT XVIII: Job Seeking Skills

Competencies:

1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.
5. Complete a job application.
6. Participate in a mock interview.
7. Write a follow-up letter.
8. Conduct a job search.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Trade and Industrial **Course Title:** Pipefitting

CIP Code: 46.0502 **Course Length** 1350 Clock Hours - 12 Months

Course Description:

The purpose of this course is to provide specialized classroom instruction and practical shop experience to prepare individuals for employment in the pipefitting industry. The course includes instruction in layout, fabrication, assembly, installation and maintenance of piping and piping systems, fixtures, and equipment for steam, hot water, heating, cooling, drainage, lubricating, sprinkling and industrial processing systems, on the basis of knowledge of systems operation and the study of building plans or working drawings. The content includes, but is not limited to, communication skills; leadership skills; human relations and employability skills; safe and efficient work practices; use of tools to cut, bend, join and weld pipes; and blueprint reading. The course content is organized into competency-based units of instruction that specify occupational competencies which the student must successfully complete.

Units of Instruction:

I. Occupational Introduction
II. Safety
III. Math
IV. Materials
V. Tools and Equipment
VI. Sketching and Blueprint Reading
VII. Oxyfuel Cutting
VIII. Welding
IX. Hangers and Supports
X. Rigging
XI. Pipe Fabrication and Installation
XII. Installation and Repair of Piping Components
XIII. Job Seeking Skills

Curriculum Competency Outline

UNIT I: Occupational Introduction

Competencies:

1. Describe the field of pipefitting.
2. Identify working conditions involved with employment in the field of pipefitting.
3. Identify job hazards associated with a pipefitter's occupation.
4. List salary and benefits associated with employment in the field of pipefitting.
5. Describe job opportunities available for the pipefitter.
6. Prepare written communication.
7. Read and comprehend written communication and information.
8. Follow written and oral directions.
9. Write legibly.
10. Utilize equipment correctly.
11. Maintain clean and orderly work area.

12. Demonstrate personal hygiene and cleanliness.
13. Exhibit pride and loyalty.
14. Work productively with others.
15. Exhibit dependability.
16. Demonstrate a willingness to learn.
17. Follow rules and regulations.
18. Demonstrate problem-solving skills.
19. Identify the initial investment requirements for pipefitters.

UNIT II: Safety

Competencies:

1. Demonstrate proper lifting and carrying techniques.
2. Demonstrate a knowledge of fire protection.
3. Demonstrate proper work habits associated with the pipefitting trade.
4. Demonstrate good work attitude.
5. Identify proper grounding techniques for electrically operated tools.
6. Wear proper clothing for the pipefitting trade.
7. Maintain a positive safety attitude.
8. Comply with the Occupational Safety and Health Act (OSHA) regulations pertaining to scaffold and ladder usage.
9. Demonstrate a knowledge of crane hand signals and safety operation.
10. Comply with regulations pertaining to fire protection.
11. Wear personal protective gear.
12. Wear safety glasses.

UNIT III: Math

Competencies:

1. Read a ruler.
2. Perform mensuration procedures as applied to the pipefitting trade.
3. Add, subtract, multiply, and divide whole numbers.
4. Add, subtract, multiply, and divide yards, feet, and inches.
5. Add, subtract, multiply, and divide fractions and mixed numbers.
6. Convert fractions to their decimal equivalents.
7. Convert decimals to their fraction equivalents.
8. Calculate the circumference of a circle.
9. Calculate the areas of rectangles, squares, parallelograms, triangles, and circles.
10. Solve problems involving right triangles.

UNIT IV: Materials

Competencies:

1. Identify various types of valves.
2. Demonstrate a knowledge of steam traps.
3. Identify various types of materials used in piping construction (bolts, nuts, gaskets).
4. Identify various types of pipe
5. Determine pipe size and wall thickness.
6. Identify fittings used in the piping trades.
7. Demonstrate a knowledge of American Society of Testing and Materials standards for pipe and fittings.
8. Demonstrate a knowledge of identification markings used in the piping trade.

UNIT V: Tools and Equipment

Competencies:

1. Identify the most common hand tools used in the piping trades.
2. Identify electrical and pneumatic tools used in the piping trade.
3. Demonstrate a knowledge of the care and safe use of hand and power tools.

4. Mark a pipe using a wrap-around.
5. Identify the tools required for a job-entry-level pipefitter.
6. Cut pipe using plasma arc equipment.
7. Cut pipe using oxyfuel equipment.

UNIT VI: Sketching and Blueprint Reading

Competencies:
1. Identify the various types of lines and symbols used on piping drawings.
2. Explain compass orientation of blueprints.
3. Identify and describe the function of coordinates, dimensions, notes and legends of blueprints.
4. Describe the purpose of plan views, section views and elevations.
5. List materials, fittings, valves, instruments and other piping components from information found on drawings.
6. Demonstrate a knowledge of computer aided design of blueprints.
7. Read and interpret information found on isometric, spool and shop drawings.
8. Interpret information found on piping and instrumentation diagrams.
9. Make a spool drawing.

UNIT VII: Oxyfuel Cutting

Competencies:
1. Set up and shut down oxyfuel equipment.
2. Make square and bevel cuts by hand.
3. Make square and bevel cuts using pipe beveling machine.
4. Demonstrate a knowledge of the safe handling and storage of oxyfuel equipment.
5. Identify safety hazards associated with oxyfuel cutting.

UNIT VIII: Welding

Competencies:
1. Set up welding equipment.
2. Identify welding processes used to weld pipe.
3. Identify safety practices associated with welding processes.
4. Identify weld joints associated with pipefitting.
5. Weld open, V-groove butt joint in 1G position, root, hot pass, fill and cap 6" schedule 40 pipe with an E-6010, and pass guided bend test according to American Society of Mechanical Engineers (ASME) standards.

UNIT IX: Hangers and Supports

Competencies:
1. Identify types of hangers.
2. Describe location and spacing of hangers and support according to type of pipe.
3. Identify beam attachments.
4. Identify types of supports.
5. Construct angle-iron supports.

UNIT X: Rigging

Competencies:
1. Identify common types of rope and cable.
2. Identify types of slings.
3. Identify and describe types of connections.
4. Tie knots.
5. Use nonverbal communication (hand signals).
6. Attach slings to pipe.
7. Identify safety practices associated with rigging and installation of pipe.

UNIT XI: Pipe Fabrication and Installation

Competencies:

1. Cut, bend, and flare tubing.
2. Lay out, fabricate, tack weld, and install a 2-piece turn.
3. Lay out, fabricate, tack weld, and install a 3-piece turn.
4. Lay out, fabricate, tack weld, and install a 4-piece turn.
5. Lay out, fabricate, tack weld, and install a 45° lateral on 4" to 6" pipe.
6. Lay out, fabricate, tack weld, and install a 90° lateral on 4" to 6" pipe.
7. Lay out, fabricate, tack weld, and install a 45° lateral on 4" to 4" pipe.
8. Lay out, fabricate, tack weld, and install a 90° lateral on 4" to 4" pipe.
9. Lay out, fabricate, tack weld, and install a rolling offset.
10. Fit and tack a 6" to 4" concentric reducer.
11. Fit and tack a 6" to 4" eccentric reducer.
12. Cut, thread and assemble an elbow on pipe from end to center dimensions.
13. Describe procedures for installation of coated pipe.
14. Describe procedures for installation of lined pipe.
15. Describe methods of "hot tap" installation.
16. Pass visual test on pipe installations for gap, dimensions and angles according to American Petroleum Institute (API), American Society of Mechanical Engineers (ASME), and American National Standards Institute (ANSI) standards.

UNIT XII: Installation and Repair of Piping Components

Competencies:

1. Install valves.
2. Install pumps and align to pipe.
3. Connect piping to piping components.
4. Assemble a steam trap station.
5. Install strainers.
6. Describe procedures for locking out valves.
7. Describe procedures for clearing lines.
8. Demonstrate a knowledge of hydrostatic and leak tests.
9. Interpret job specifications.
10. Install flanges.

UNIT XIII: Job Seeking Skills

Competencies:

1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.
5. Write a letter of application.
6. Complete a job application.
7. Participate in a mock interview.
8. Write a follow-up letter.
9. Conduct a job search.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Trade and Industrial **Course Title:** Plumbing

CIP Code: 46.0503 **Course Length** 1350 Clock Hours - 12 Months

Course Description:

The purpose of this course is to prepare individuals to assemble, install, and repair pipes, fittings, and fixtures of water and drainage systems for homes and other buildings. All work is done according to specifications and plumbing codes.

The course content is organized into competency-based units of instruction that specify occupational competencies which the student must successfully complete.

Units of Instruction:

I. Orientation
II. Plumber's Mathematics
III. Tools, Equipment, and Materials
IV. Plumbing Systems
V. Codes
VI. Systems Rough-In
VII. Fixture and Appliance Installation
VIII. Systems Maintenance and Repair
IX. Job Seeking Skills

Curriculum Competency Outline

UNIT I: Orientation

Competencies:

1. Demonstrate knowledge of the plumbing industry.
2. Describe working conditions of the trade.
3. Identify safety hazards.
4. Describe factors affecting human relations.
5. Apply basic first aid techniques.
6. Demonstrate good attitudes and work habits.

UNIT II: Plumber's Mathematics

Competencies:

1. Write and read whole numbers.
2. Add, subtract, multiply, and divide whole numbers.
3. Add, subtract, multiply, and divide common fractions.
4. Add, subtract, multiply, and divide decimal fractions.
5. Convert common fractions to decimals.
6. Convert decimals to common fractions.
7. Solve problems dealing with angles and offsets.

UNIT III: Tools, Equipment, and Materials

Competencies:

1. Identify plumbing tools.
2. Demonstrate proper use and care of tools and equipment.
3. Identify plumbing and piping materials.
4. Demonstrate proper techniques of joining pipe.

UNIT IV: Plumbing Systems

Competencies:

1. Identify parts and materials of waste and vent systems.
2. Identify parts and materials of potable water systems.
3. Identify parts and materials of gas systems.
4. Identify parts and materials of special waste systems.
5. Identify and demonstrate proper use of hangers and supports.

UNIT V: Codes

Competencies:

1. Demonstrate ability to use state and local code books.
2. Demonstrate knowledge of definitions in code books.
3. Demonstrate ability to identify and avoid cross connections.
4. Identify the trap seal and the various methods by which it can be lost.

UNIT VI: Systems Rough-In

Competencies:

1. Identify and locate building water, sewer, and gas services.
2. Demonstrate ability to locate fixtures in a building.
3. Draw a plumbing layout on floor plan with fixture center lines.
4. Draw an isometric of the sewer, waste, and vent piping.
5. Draw an isometric of a potable water system.
6. Prepare a material take-off.
7. Determine slope of horizontal waste and sewer lines.
8. Determine necessity for and location of sleeves.
9. Demonstrate ability to rough in a plumbing system.

UNIT VII: Fixture and Appliance Installation

Competencies:

1. Install a stop and waste valve (solder method).
2. Install a kitchen sink faucet.
3. Install a dual control lavatory faucet with pop-up drain plug.
4. Install a cast iron water closet flange.
5. Install a plastic water closet flange.
6. Install a lavatory trap.
7. Install a kitchen sink trap.
8. Install a brass to lead pipe water closet flange.
9. Install a water closet (floor mount).
10. Install a lavatory (wall hung type).
11. Install a bathtub (5′ recessed).
12. Install shower bath accessories.
13. Install an electric water heater.
14. Install a dishwasher.
15. Install a garbage disposal unit.
16. Install a gas water heater.

UNIT VIII: Systems Maintenance and Repair

Competencies:

1. Replace a section of galvanized water supply line.
2. Repair a leaking water faucet or valve.
3. Repair a leaking shower valve.
4. Describe the procedure for replacing a water heater.
5. Identify the parts of a water closet flush tank and flushometer valve.
6. Repair a water closet.
7. Insulate water lines.
8. Clear obstructions from a lavatory drain.
9. Clear obstructions from a water closet drain.
10. Clear obstructions from a main drain line.

UNIT IX: Job Seeking Skills

Competencies:

1. Prepare a personal resume.
2. Fill out a job application.
3. Prepare a letter of application.
4. Prepare a follow-up letter.
5. Participate in a mock job interview.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Trade and Industrial

Course Title: Power Line Technician

CIP Code: 46.0303

Course Length 1350 Clock Hours - 12 Months

Course Description:

This course is designed to prepare individuals for employment as electrical line repairers, maintainers, and erectors. The content includes, but is not limited to, communication skills; leadership skills; human relations and employability skills; safe and efficient work practices; installation, operation, and maintenance of local, long distance, and rural power lines; erection and construction of pole lines; rigging; and digger and bucket truck operation. The content is organized into competency-based units of instruction which specify occupational competencies the individual must successfully complete.

Units of Instruction:

- I. Occupational Introduction
- II. Tools
- III. Basic Electricity
- IV. Electrical Systems
- V. Safety
- VI. Materials
- VII. Rigging
- VIII. Pole Handling and Installation
- IX. Conductor Installation
- X. Transformers, Connections, and Banking
- XI. Live Line Work
- XII. Bucket Truck Operations
- XIII. Digger Truck Operations
- XIV. Right-of-Way
- XV. Troubleshooting
- XVI. Public Relations
- XVII. Job Seeking Skills

Curriculum Competency Outline

UNIT I: Occupational Introduction

Competencies:

1. Describe the power line technician.
2. Describe the work environment associated with the power line technician.
3. Identify job hazards associated with the field of power line technician.
4. Identify employment opportunities available to a power line technician.
5. List salary and benefits associated with power line technician.
6. Describe personal attire and equipment involved with being a power line technician.
7. Demonstrate a willingness to learn.
8. Exhibit dependability.
9. Demonstrate punctuality.
10. Demonstrate the ability to communicate with customers in an approved manner.

11. Demonstrate personal hygiene and cleanliness.
12. Comply with safety and health rules.
13. Select correct tools and equipment.
14. Utilize equipment and tools correctly.
15. Exhibit pride and loyalty.
16. Demonstrate job site cleanliness.

UNIT II: Tools

Competencies:

1. Identify personal climbing tools.
2. Climb poles using personal climbing tools.
3. Identify hand tools.
4. Identify line tools.
5. Identify and use volt-amp meter.
6. Describe the care of hand and line tools.

UNIT III: Basic Electricity

Competencies:

1. Identify electrical symbols.
2. Define terms associated with basic electricity.
3. Solve problems using basic math.
4. Solve problems using Ohm's Law.
5. Use voltmeter to measure secondary voltage.
6. Use ammeter to check secondary amperage.
7. Connect batteries in series.
8. Connect batteries in parallel.
9. Read kilowatt hour meters - single phase.
10. Read demand meters.

UNIT IV: Electrical Systems

Competencies:

1. Identify transmission lines and stations by voltages, structures, and purpose.
2. Identify distribution substations by voltages and purpose.
3. Identify the components of a substation.
4. Identify procedures for bypassing an oil circuit recloser and current transformer.
5. Demonstrate a knowledge of current transformers.
6. Identify three-phase distribution.
7. Identify two-phase distribution.
8. Identify single-phase distribution.
9. Identify secondary lines and structures.
10. Identify underground residential distribution (URD).
11. Demonstrate a knowledge of construction specifications.

UNIT V: Safety

Competencies:

1. Become certified in using cardiopulmonary resuscitation (CPR) techniques.
2. Become certified in multi-media first aid techniques.
3. Demonstrate a knowledge of hazardous chemicals used in the power line industry and disposal of such.
4. Identify pole-top rescue techniques.
5. Demonstrate a knowledge of the National Electrical Safety Code.
6. Identify rubber glove classification according to the American Society of Testing and Materials.
7. Participate in a defensive driving course.
8. Identify Department of Transportation requirements for operating large trucks.
9. Identify line grounding techniques.

UNIT VI: Materials

Competencies:

1. Identify classses of poles.
2. Identify cross arms and braces.
3. Identify types of insulators.
4. Identify types of hardware.
5. Identify types of conductors.
6. Identify types of grounding devices.
7. Identify types of sleeves and connectors.
8. Identify types of overhead and underground conductors.
9. Identify types of ties, preforms, and armor rods.
10. Identify types of anchors.
11. Identify types of overhead and underground transformers.
12. Identify types of underground terminators.
13. Identify types of elbows.
14. Identify types of fuses.
15. Identify types of switches.
16. Identify types of interrupters.
17. Identify types of arrestors.
18. Identify types of capacitors.
19. Identify pull boxes.
20. Identify types of oil circuit breakers (OCB).
21. Identify types of oil circuit reclosers.
22. Identify switching cabinets.
23. Identify transformer pads.
24. Identify secondary pedestals.
25. Identify electronic three-phase breaker.

UNIT VII: Rigging

Competencies:

1. Identify types of rope.
2. Identify types of cable.
3. Identify types of slings.
4. Identify block and tackle assembly.
5. Use block and tackle.
6. Calculate working load of various types of rope.
7. Splice rope.
8. Tie a crown knot.
9. Tie a bowline knot.
10. Tie a clove hitch.
11. Tie a rolling bend.
12. Tie a square knot.
13. Tie a timber hitch.
14. Make an eye-splice.
15. Make up a hand line.
16. Identify the care and use of rope.
17. Use non-verbal communications (hand signals).

UNIT VIII: Pole Handling and Installation

Competencies:

1. Load and unload poles on pole trailer.
2. Determine depth to set pole.
3. Dig pole hole using hand method.
4. Install ground wire on pole.
5. Make up and install a three-phase single cross arm.
6. Make up and install a three-phase double cross arm.

7. Set and align pole.
8. Install anchor and guy.
9. Install ground rod.
10. Install pole-top pin.
11. Install personal protective ground on a de-energized three-phase line.

UNIT IX: Conductor Installation

Competencies:

1. Install primary conductor.
2. Pull wire and make up a dead-end shoe.
3. Install armor rod and tie-in wire on pin-type insulator.
4. Install preformed tie.
5. Install a top groove conductor tie on a de-energized copper conductor.
6. Resag conductors and install aluminum conductor steel reinforced (ACSR) sleeve.
7. Install a secondary conductor.
8. Install a wire wedge clamp.
9. Install a secondary splice tri-plex service.
10. Make a dead-end on secondary using U-bolts.
11. Connect 120/240 secondary to weatherhead.
12. Make a splice in underground secondary cable.
13. Make a splice in underground primary cable.

UNIT X: Transformers, Connections, and Banking

Competencies:

1. Complete a transformer record sheet.
2. Identify and classify transformer types.
3. Install lighting arrestors.
4. Connect a pad mount transformer.
5. Install and connect a single-phase transformer 120/240.
6. Install and connect on pole a wye-delta bank for three-phase, four-wire 120/240 volt service.
7. Connect a wye-delta bank for three-phase, three-wire 240 volt service.
8. Connect a wye-wye bank for three-phase, four-wire 120/208 volt service.
9. Connect a wye-wye bank for three-phase, four-wire 277/480 volt service.
10. Connect an open-wye, open-delta bank for three-phase, four-wire 120/240 volt service.
11. Connect an open-wye, open delta bank for three-phase, three-wire 240 volt service.
12. Connect an open-delta, open-delta bank for three-phase, four-wire 120/240 volt service.

UNIT XI: Live Line Work

Competencies:

1. Install a wire tong saddle.
2. Change insulator on hot line conductor using hot line tools.
3. Change insulator using rubber gloves.
4. Demonstrate the ability to install and work off a Baker Board.
5. Install insulated rubber line hose from pole.
6. Install insulated blankets from pole.
7. Install insulated rigid line guard.
8. Install insulator cover (hood).
9. Use extendo-stick to change a barrel on cut-out block.
10. Use a rotation meter to check rotation on a three-phase service.
11. Phase out a line using phasing sticks.
12. Change rotation on a three-phase service.
13. Demonstrate knowledge of the procedure to connect voltage regulators to a three-phase line.
14. Demonstrate ability to disconnect, transport and store capacitors.

UNIT XII: Bucket Truck Operations

Competencies:
1. Perform truck inspection.
2. Identify bucket truck controls.
3. Operate bucket truck using ground controls.
4. Operate bucket truck using bucket controls
5. Install protective cover-up on three-phase lines.
6. Install three-phase single cross arm from bucket truck.
7. Install three-phase double cross arm from bucket truck.
8. Hang a single transformer on pole from bucket truck.
9. Hang bells on transmission line.
10. Change insulator using insulating rubber gloves from bucket truck.

UNIT XIII: Digger Truck Operations

Competencies:
1. Perform truck inspection.
2. Identify digger controls.
3. Dig hole with digger.
4. Set and align pole with truck.
5. Pull pole with truck.
6. Inspect and hook up pole trailer.
7. Perform trailer backing techniques.
8. Set pole in an energized line.
9. Identify proper traffic control requirements.

UNIT XIV: Right-of-Way

Competencies:
1. Demonstrate the knowledge of large, heavy limb removal techniques.
2. Demonstrate the knowledge of limb removal over energized conductors.
3. Demonstrate the ability to fell a tree.
4. Operate power saws and trimmers.

UNIT XV: Troubleshooting

Competencies:
1. Troubleshoot secondary for low voltage.
2. Troubleshoot secondary for high voltage.
3. Troubleshoot secondary for blinking lights.
4. Troubleshoot potential on water pipes or appliances.
5. Troubleshoot frequent service breaker tripping.
6. Troubleshoot electrical equipment.
7. Troubleshoot primary line for low line voltage.
8. Troubleshoot primary line for high line voltage.
9. Troubleshoot primary line for blinking lights.
10. Troubleshoot primary line for extreme voltage swing.
11. Troubleshoot primary line for radio and television interference.
12. Troubleshoot primary line for line outage.

UNIT XVI: Public Relations

Competencies:
1. Identify terms associated with customer contact.
2. Describe proper communication techniques involved with customer contact.
3. Demonstrate a knowledge of how to properly enter private property with respect to damage of fences, shrubs, grass, etc.
4. Demonstrate the ability to remove debris after completing job on private property.

UNIT XVII: Job Seeking Skills

Competencies:

1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.
5. Complete a job application.
6. Participate in a mock interview.
7. Write a follow-up letter.
8. Conduct a job search.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Trade and Industrial

Course Title: Truck Driving

CIP Code: 49.0205

Course Length 506 Clock Hours - 4½ Months

Course Description:

The purpose of this course is to prepare individuals for employment as tractor-trailer truck drivers. The course content includes instruction in operating gasoline and diesel powered vehicles; day and night driving; in-city, interstate, and two-lane highways; loading and unloading; backing and maneuvering vehicle; verifying load against shipping papers; keeping records; and performing pre-trip and post-trip inspections. Includes instruction in communication skills, human relations and employability skills, safe and defensive driving habits, emergency first-aid assistance, and driver maintenance and emergency repair duties.

Units of Instruction:

I. Occupational Introduction
II. Safety (Federal and State Regulations)
III. Clerical and Documents
IV. Pre-trip and Post-trip Inspections
V. Driving the Tractor-Trailer
VI. Job Seeking Skills

Curriculum Competency Outline

UNIT I: Occupational Introduction

Competencies:

1. Describe the field of truck driving.
2. Identify working conditions involved with truck driving.
3. Identify job hazards associated with the field of truck driving.
4. List salary and benefits associated with employment in the truck driving occupation.
5. Describe job opportunities available for truck drivers.
6. Identify investment requirements for professional truck drivers.
7. Prepare, read, interpret, and write necessary communications concerned with truck driving.
8. Explain the purpose of drug testing for truck drivers.
9. Explain the purpose of polygraph testing for truck drivers.
10. Describe driving habits concerned with safe, courteous and defensive driving.
11. Demonstrate the ability to handle currency.
12. Exhibit pride and loyalty.
13. Utilize equipment correctly.
14. Demonstrate punctuality.
15. Demonstrate personal hygiene and cleanliness.
16. Comply with dress code established by the trucking industry.
17. Work productively with others.
18. Follow rules and regulations.
19. Describe the traits of good salesmanship.
20. Describe the traits associated with attitude toward good company/customer relationships.

UNIT II: Safety (Federal and State Regulations)

Competencies:

1. Pass written test for obtaining operator's license.
2. Pass road test for obtaining operator's license.
3. Pass physical examination.
4. Maintain good motor vehicle driving record.
5. Perform pre-trip and post-trip inspections.
6. Demonstrate a knowledge of the Federal Motor Carrier Safety Regulations as prescribed by the U. S. Department of Transportation.
7. Demonstrate a knowledge of certification requirements required for qualifying to haul materials.
8. Demonstrate a knowledge of multi-media first-aid techniques.

UNIT III: Clerical and Documents

Competencies:

1. Complete Bill of Lading.
2. Complete freight bill.
3. Fill out pre-trip and post-trip inspection forms.
4. Perform inventory of goods delivered and picked up.
5. Collect on delivery (C.O.D.s).
6. Fill out damage reports.
7. Fill out accident reports.
8. Fill out job injury report.
9. Fill out fuel tickets.
10. Fill out driver manifest.
11. Maintain driver log.

UNIT IV: Pre-trip and Post-trip Inspections

Competencies:

1. Inspect exterior condition of vehicle for leaks, weak springs, and loose or hanging items.
2. Check engine oil, fuel, coolant, belts, wiring, battery, cab and hood latch.
3. Check inside cab for proper operation of oil, amp and air gauges, lights, horn, low air warning, air build-up, air loss, parking brake, heater, defroster, and steering and clutch for free play.
4. Test windshield wipers.
5. Check rear-vision mirrors.
6. Inspect tires for correct tread depth and defects.
7. Check wheels, lugs, hubs, seals and mud flaps.
8. Check exterior lights, including emergency flashers, for correct operation.
9. Check fifth wheel safety lock and trailer landing gear.
10. Check air hoses and drain air tank.
11. Check air and electrical connections, fuel and exhaust system.
12. Check emergency equipment.
13. Adjust trailer and tractor brakes if necessary on pre-trip inspection.

UNIT V: Driving the Tractor-Trailer

Competencies:

1. Start engine without difficulty.
2. Allow proper warm-up.
3. Read and interpret gauges on instrument panel.
4. Maintain proper engine speed.
5. Demonstrate a basic knowledge of engines (gas and diesel).
6. Start loaded unit smoothly.
7. Use clutch properly.
8. Time gearshifts properly.
9. Shift gears smoothly.

10. Use proper gear sequence.
11. Demonstrate a knowledge of the operating principles of air brakes.
12. Demonstrate proper use of tractor protection valve.
13. Test brakes before starting trip.
14. Adjust brakes.
15. Steer properly without over-control.
16. Maintain vehicle control without wander.
17. Demonstrate a knowledge of lighting regulations.
18. Demonstrate proper headlight beam usage.
19. Demonstrate ability to upshift transmission smoothly.
20. Demonstrate ability to downshift transmission smoothly.
21. Stop truck smoothly.
22. Stop and restart truck on a hill without rolling back.
23. Signal turns properly.
24. Perform emergency stop without jackknifing.
25. Demonstrate defensive driving habits.
26. Perform routine functions in cab without taking eyes from road.
27. Demonstrate ability to couple and uncouple tractor to trailers (without shortcuts).
28. Set trailer brake and test fifth wheel coupling by a slight pull forward.
29. Demonstrate the ability to back a tractor-trailer in a straight line.
30. Demonstrate the ability to back a tractor-trailer using the jackknife method (left and right).
31. Demonstrate the ability to back a tractor-trailer from the blind side.
32. Demonstrate the ability to back a tractor-trailer into a minimum clearance area.
33. Demonstrate the ability to enter and exit interstate highways correctly.
34. Change position of tandems on long trailers.
35. Demonstrate the ability to pass a vehicle on a two-lane and four-lane highway.
36. Make a right turn from a two-lane highway onto a two-lane highway.
37. Make a right turn from a two-lane highway onto a four-lane highway.
38. Make a right turn from a four-lane highway onto a four-lane highway.
39. Make a left turn from a left-turn lane.
40. Make a left turn without a left-turn lane.
41. Back tractor-trailer up to a dock (2 pull-ups) smoothly.
42. Park tractor-trailer in a parallel space.
43. Change lanes on a four-lane highway.
44. Adjust driving techniques according to weather conditions.
45. Adjust driving techniques according to traffic situations.
46. Demonstrate a knowledge of traffic signs and signals.
47. Demonstrate a knowledge of authorized and unauthorized parking areas for tractor-trailers.
48. Stop engine, park and secure tractor-trailer.
49. Park vehicle, leave engine running, and secure.
50. Perform competencies 1-49 in Unit V at night.
51. Identify different types of trailers.
52. Demonstrate the ability to drive single-screw and twin-screw tractors.
53. Demonstrate the ability to drive tractor-trailer rigs using the following trailers: van, flat bed, and tanker.

UNIT VI: Job Seeking Skills

Competencies:

1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.
5. Write a letter of application.
6. Complete a job application.

7. Participate in a mock interview.
8. Write a follow-up letter.
9. Conduct a job search.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education
Competency-Based Course Outline

Program Area: Trade and Industrial

Course Title: Upholstering

CIP Code: 48.0303

Course Length 1350 Clock Hours - 12 Months

Course Description:

The purpose of this instructional course is to train individuals in all aspects of upholstering. Classroom and shop experiences are concerned with furniture repair, refinishing and upholstering, vehicle upholstering, sewing machine operation, communication skills, human relations, and employability skills. Includes instruction in installing, repairing, arranging, and securing springs, filler, and padding; cutting, sewing, and trimming; cushion filling, tufting, buttoning; wood repair and refinishing; measuring and determining cost of materials and labor; identifying and using chemical treatments that prolong the life of fabrics or materials; installing headliners, fitting tonneau covers, installing vehicle carpeting, upholstering seats, door panels, and arm rests. The course emphasizes safe and efficient work practices and includes business practices for the entrepreneur. The content is organized into competency-based units of instruction which specify occupational competencies the individual must successfully complete.

Units of Instruction:

I. Occupational Introduction
II. Human Relations
III. Safety
IV. Tools and Equipment
V. Upholstery Supplies
VI. Base Construction
VII. Padding
VIII. Wood Reconditioning and Repair
IX. Sewing Machine
X. Top Covers
XI. Cushions
XII. Channeling and Tufting
XIII. Upholstering Techniques
XIV. Business Practices
XV. Job Seeking Skills

Specialty Areas
XVI. Furniture Refinishing
XVII. Vehicle Upholstery

Curriculum Competency Outline

UNIT I: Occupational Introduction

Competencies:

1. Describe the field of upholstery.
2. Identify working conditions involved with the upholstery trade.
3. Identify job hazards associated with upholstery.
4. Describe salary and benefits associated with employment in the upholstery field.

5. Identify job opportunities available for the upholsterer.
6. Identify the initial investment requirements for the entrepreneur.

UNIT II: Human Relations

Competencies:

1. Demonstrate a professional attitude.
2. Demonstrate the ability to be a good listener.
3. Demonstrate high reliability in the performance of service procedures.
4. Follow oral and written instructions.
5. Maintain trade tools and equipment in optimal condition.
6. Evaluate services performed with the customer.
7. Demonstrate an attitude of loyalty towards the employer.
8. Demonstrate the ability to select fabric with regard to style, use, and design of furniture.
9. Demonstrate the ability to communicate instructions accurately and effectively.
10. Demonstrate personal hygiene and cleanliness.

UNIT III: Safety

Competencies:

1. Identify safety hazards associated with hand tools.
2. Identify safety hazards associated with power tools.
3. Identify safety hazards associated with chemicals.
4. Demonstrate a knowledge of the proper disposal of chemicals.
5. Describe safety hazards associated with electrical power equipment.
6. Read and interpret safety instructions.
7. Describe procedures for storing flammable and/or toxic chemicals.
8. Demonstrate a knowledge of proper lifting techniques.
9. Apply safety practices.
10. Identify fire hazards associated with upholstering and refinishing.

UNIT IV: Tools and Equipment

Competencies:

1. Identify hand tools used in the upholstery trade.
2. Demonstrate the ability to use hand tools correctly.
3. Identify various types of industrial sewing machines.
4. Describe various types of power tools used for upholstery.
5. Demonstrate the ability to use power tools correctly.
6. Describe layout and measuring tools.
7. Use layout and measuring tools.
8. Identify various types of equipment used in upholstery.
9. Demonstrate the ability to use equipment correctly.

UNIT V: Upholstery Supplies

Competencies:

1. Identify various types of supplies used in upholstery.
2. Identify types of fabrics used for upholstering furniture.
3. Describe materials commonly used for stuffing and/or padding furniture.
4. Identify various types of springs used for upholstering furniture.
5. Identify various types of fastening devices used in upholstery.
6. Describe material used for decorative trim.
7. Identify various types of zippers needed for upholstery.

UNIT VI: Base Construction

Competencies:

1. Identify terms associated with furniture design and construction.
2. Identify the parts of various types of furniture frames.
3. Identify various types of springs used in the frame construction of furniture.

4. Repair frames.
5. Identify various types of wood joints used in furniture construction.
6. Demonstrate the ability to remove, repair, and install springs.
7. Demonstrate the ability to remove, repair and install front edge wire.
8. Install and repair webbing.
9. Install and repair dust covers.
10. Install burlap.
11. Install edge roll.
12. Apply safety practices when repairing and installing springs, edge wire, and repairing frames.
13. Demonstrate a knowledge of furniture hygiene practices.

UNIT VII: Padding

Competencies:
1. Identify terms associated with padding used in upholstered furniture.
2. Identify and describe the application of various types of padding.
3. Describe the cleaning and fumigating of padding.
4. Identify the correct methods for disposal of old padding.
5. Demonstrate the ability to measure furniture for the correct amount of padding to be used.
6. Demonstrate the ability to measure and cut padding.
7. Demonstrate the proper techniques of installing padding to the various sections of furniture.

UNIT VIII: Wood Reconditioning and Repair

Competencies:
1. Identify terms associated with furniture refinishing.
2. Evaluate the wood portions of furniture to determine the amount and type of refinishing needed.
3. Identify and describe the application of various types of sand paper.
4. Identify and describe the application of various types of stains.
5. Identify and describe the application of various types of finish removers.
6. Identify and describe the application of various types of finishes.
7. Identify and describe the application of various types of toners.
8. Demonstrate the ability to refinish the wood sections of upholstered furniture back to their original condition.
9. Demonstrate a knowledge of personal protective clothing and equipment to be worn when working with toxic chemicals.
10. Demonstrate a knowledge of the proper handling and disposal of toxic chemicals.
11. Demonstrate the ability to reconstruct and/or repair the wood portions of furniture.

UNIT IX: Sewing Machine

Competencies:
1. Identify and describe the functions of the major parts of an industrial sewing machine.
2. Identify areas of oiling on the sewing machine.
3. Demonstrate the ability to clean and oil an industrial sewing machine.
4. Demonstrate the ability to remove, rewind, and replace a bobbin.
5. Demonstrate the ability to thread an industrial sewing machine.
6. Identify preventive maintenance procedures for an industrial sewing machine according to the manufacturer's specifications.
7. Perform preventive maintenance according to the manufacturer's specifications.
8. Demonstrate the ability to remove and replace needles according to the manufacturer's specifications.
9. Sew welt cording.
10. Sew a butt seam.

11. Sew a flat seam.
12. Sew a French seam.
13. Apply safety practices when operating an industrial sewing machine.

UNIT X: Top Covers

Competencies:

1. Identify terms associated with top covers as used in the upholstery profession.
2. Identify terms associated with the measurement and layout of top covers for upholstery.
3. Demonstrate the ability to identify and measure various sections of given furniture.
4. Demonstrate the ability to identify and differentiate between woven, nonwoven, natural and synthetic material used for upholstery purposes.
5. Demonstrate a knowledge of the design and nap of fabric relating to installation procedures.
6. Demonstrate the ability to estimate the amount of top cover needed by computing measurements taken from a given piece of furniture.
7. Demonstrate the ability to lay out, cut, and label top cover material for a given piece of furniture.
8. Demonstrate a knowledge of fire prevention and fire codes associated with upholstery material.
9. Identify and describe various types of sealants used on upholstery material.
10. Apply fabric sealants.
11. Demonstrate the ability to select design motif and/or type of fabric for a given style of furniture.
12. Demonstrate a knowledge of the working characteristics of various types of top cover material.
13. Demonstrate the ability to sew and attach a single welt cord.
14. Demonstrate the ability to sew and attach a French double welt cord.
15. Demonstrate the ability to tailor and fit top covers.
16. Demonstrate the ability to install top covers in accordance with the design motif and/or nap.
17. Demonstrate a knowledge of decorative trim used to enhance top covers and/or furniture design.
18. Demonstrate the ability to use a variety of methods for fastening top covers.
19. Demonstrate the ability to install gimp in a decorative fashion.
20. Demonstrate the ability to use a variety of tacks as decorative trim.
21. Demonstrate the ability to apply trim panels.

UNIT XI: Cushions

Competencies:

1. Identify terms associated with making cushions and sewing the covers.
2. Demonstrate the ability to construct a knife edge cushion.
3. Demonstrate the ability to construct a box cushion.
4. Demonstrate the ability to construct a pleated and mitered cushion.
5. Demonstrate the ability to construct a waterfall cushion.
6. Sew and apply welting.
7. Attach boxing.
8. Sew and attach zippers.
9. Demonstrate the ability to install ventilators in various types of cushions.

UNIT XII: Channeling and Tufting

Competencies:

1. Identify terms associated with tufting and channeling.
2. Identify various types of tufting.
3. Identify various types of channeling.
4. Demonstrate the ability to upholster furniture using diamond tufting methods.

5. Demonstrate the ability to upholster furniture using channeling methods.
6. Demonstrate the ability to do bisquet tufting.
7. Demonstrate the ability to do rolled and pleated upholstery.

UNIT XIII: Upholstering Techniques

Competencies:

1. Identify terms associated with upholstering furniture.
2. Demonstrate the ability to upholster a recliner chair.
3. Demonstrate the ability to upholster a channel-back chair.
4. Demonstrate the ability to upholster a tufted-back chair.
5. Demonstrate the ability to upholster a loose-cushioned sofa.
6. Demonstrate the ability to upholster a hide-a-bed sofa.
7. Demonstrate the ability to upholster an attached cushioned sofa.
8. Apply safety practices when upholstering furniture.

UNIT XIV: Business Practices

Competencies:

1. Identify terms associated with business and administrative practices.
2. Prepare service bills.
3. Maintain customer accounts and records.
4. Maintain equipment inventory and supply control.
5. Read and interpret written communications and instructions.
6. Execute maintenance contracts and service agreements.
7. Demonstrate a knowledge of the monetary factor associated with doing business.

UNIT XV: Job Seeking Skills

Competencies:

1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.
5. Write a letter of application.
6. Complete a job application.
7. Participate in a mock interview.
8. Write a follow-up letter.
9. Conduct a job search.

SPECIALTY AREAS

UNIT XVI: Furniture Refinishing

Competencies:

1. Identify terms associated with furniture refinishing.
2. Employ all safety precautions when working with toxic chemicals.
3. Demonstrate a knowledge regarding the correct disposal of toxic waste.
4. Demonstrate a knowledge of the various types of stripping materials available for the furniture refinisher.
5. Demonstrate the ability to remove old finishes from various types of furniture.
6. Demonstrate a knowledge of the types of woods used for furniture construction.
7. Demonstrate a knowledge of the various types of wood joints used in furniture construction.
8. Demonstrate a knowledge of wood adhesives.
9. Describe and identify the various types of wood fillers and/or stick shellacs used for wood repair and refinishing.
10. Demonstrate the ability to repair, reconstruct and recondition the base-wood portions of furniture.

11. Demonstrate a knowledge of the various types of abrasives necessary for furniture refinishing.
12. Demonstrate the ability to sand wood with regard to grain structure and/or wood type to result in an appropriate surface for finishes.
13. Identify and describe the various types of wood stains available for furniture reconditioning.
14. Demonstrate the ability to select stains with regard to color, type of wood, and furniture design.
15. Demonstrate the ability to apply stains.
16. Identify and describe the various types of sealers used in furniture reconditioning.
17. Demonstrate the ability to select, mix, and apply sealers in accordance with the type of wood and/or appearance desired on a given piece of furniture.
18. Identify and describe the various types of top coat finishes used to achieve transparent, matte, and/or opaque appearances.
19. Demonstrate the ability to apply finishes.
20. Identify and describe the use of toners in wood finishes.
21. Demonstrate the ability to apply toners.
22. Identify and describe various types of hardware used in furniture construction.
23. Demonstrate the ability to select the appropriate style and/or design of hardware to match the style and period of furniture.
24. Install furniture hardware.
25. Demonstrate a knowledge of caning as used in furniture construction.
26. Demonstrate the ability to install caning.

UNIT XVII: Vehicle Upholstery

Competencies:

1. Apply basic upholstery and trim skills.
2. Identify terms associated with vehicle upholstery.
3. Demonstrate the ability to install carpet.
4. Demonstrate the ability to reupholster various types of seats.
5. Reupholster door panels and arm rests.
6. Demonstrate the ability to repair, repad and reupholster dashboards.
7. Fabricate and install headliners and accessories.
8. Fabricate and fit tonneau covers.
9. Fabricate and fit wheel covers.
10. Remove and install convertible tops.
11. Demonstrate the ability to fabricate and install landau tops.
12. Demonstrate the ability to reupholster various upholstered parts of vehicles.
13. Demonstrate the ability to calculate cost of materials and labor.
14. Demonstrate the ability to sew and install diamond-tufted seat covers.
15. Demonstrate the ability to reupholster boat and motorcycle seats.

CURRICULUM STANDARDS
Louisiana Vocational-Technical Education

Competency-Based Course Outline

Program Area: Trade and Industrial **Course Title:** Welding

CIP Code: 48.0508 **Course Length** 1800 Clock Hours - 16 Months

Course Description:

The purpose of this course is to prepare individuals for employment in the field of welding. Instruction is provided in various processes and techniques of welding and fabrication skills including oxyacetylene cutting, carbon arc cutting, shielded metal arc welding, gas tungsten arc welding, flux-cored arc welding, gas metal arc welding, blueprint reading, and fabrication. The advanced portion of the course includes the processes of pipe welding, submerged arc welding, plasma arc cutting, and maintenance welding. The content includes communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, certification test preparation, and the use of current industry standards, practices and techniques. The content is organized into competency-based units of instruction which specify occupational competencies the individual must successfully complete.

Units of Instruction:

Basic Welding

I. Occupational Introduction
II. Safety
III. Hand Tools
IV. Oxyfuel Cutting
V. Air Carbon Arc Cutting
VI. Shielded Metal Arc Welding (SMAW)
VII. Gas Tungsten Arc Welding (GTAW)
VIII. Flux-Cored Arc Welding (FCAW)
IX. Gas Metal Arc Welding (GMAW)
X. Materials
XI. Blueprint Reading and Sketching
XII. Fabrication Project/Qualification

Advanced Welding

XIII. Pipe Welding
XIV. Submerged Arc Welding (SAW)
XV. Light Gage Material—1/16 Maximum Thickness
XVI. Plasma Arc Cutting (PAC)
XVII. Nonferrous Alloys
XVIII. Maintenance Welding
XIX. Job Seeking Skills

Curriculum Competency Outline

BASIC WELDING

UNIT I: Occupational Introduction

Competencies:
1. Describe the field of welding.
2. Identify working conditions involved with welding.

3. Identify job hazards associated with the field of welding.
4. List salary and benefits associated with employment in the field of welding.
5. Identify job opportunities available to welders.
6. Identify initial investment for entrepreneurship.
7. Demonstrate a willingness to learn.
8. Write legibly.
9. Prepare written communications.
10. Exhibit dependability.
11. Demonstrate punctuality.
12. Follow rules and regulations.
13. Read and comprehend written communication and information found in technical manuals.
14. Demonstrate personal hygiene and cleanliness.
15. Comply with safety and health rules.
16. Utilize equipment correctly.
17. Select correct tools and equipment.
18. Work productively with others.
19. Demonstrate problem-solving skills.
20. Exhibit pride and loyalty.
21. Demonstrate a knowledge of the various trade and/or professional organizations available to the welder.

UNIT II: Safety

Competencies:

1. Identify personal safety equipment.
2. List safety rules for welding.
3. Demonstrate use of fire extinguishers.
4. Demonstrate proper lifting techniques.
5. Identify fire hazards.
6. Identify electrical hazards.
7. Demonstrate cardiopulmonary resuscitation (CPR) techniques.
8. Inspect work area and equipment for safe working environment.
9. Demonstrate multi-media first aid techniques.
10. Apply Occupational Safety and Health Act (OSHA) regulations when using ladders and scaffolds.
11. Identify types and flammability of gases.
12. Demonstrate a knowledge of safety requirements when working with heights.
13. Identify American Welding Society (AWS) regulation 249.1.
14. Correct safety hazards.

UNIT III: Hand Tools

Competencies:

1.. Identify welding hand tools.
2. Identify unsafe hand tool practices.
3. Use hand grinders.
4. Use pedestal grinder.
5. Measure parts with semi-precision measuring tools.
6. Use an air chisel.
7. Use a power wire brush.
8. Inspect parts with precision measuring tools.
9. Use a framing square.
10. Use a bevel square.
11. Use a combination square.
12. Use a fillet weld gauge.
13. Use hand tools.

UNIT IV: Oxyfuel Cutting

Competencies:

1. Set up and shut down portable oxyfuel equipment.
2. Identify safe practices for using oxyfuel equipment.
3. Identify safe gas handling practices.
4. Identify proper storage for oxyfuel bottles.
5. Demonstrate three types of flames.
6. Cut a straight line on thin plate using hand-held torch.
7. Cut a circle on thin plate using hand-held torch.
8. Cut a bevel on thick plate using hand-held torch.
9. Cut a circle on thick plate using hand-held torch.
10. Cut metal with track cutter (bevel and straight).
11. Set up pipe beveling machine and bevel pipe.

UNIT V: Air Carbon Arc Cutting

Competencies:

1. Demonstrate safe use of air arc gouge equipment.
2. Set up air carbon arc cutting equipment.
3. Gouge plate using air carbon arc equipment.

UNIT VI.: Shielded Metal Arc Welding (SMAW)

Competencies:

1. Identify safe practices for SMAW.
2. Set up SMAW equipment.
3. Weld stringer and weave beads on plate in the flat position using 6010 and 7018 electrodes.
3. Weld beads on plate using whip techniques with 6010 and 7018 electrodes.
4. Weld beads on plate using whip techniques with 6010 electrode.
5. Weld circle beads on plate in the flat position using 6010 electrode.
6. Weld stringer and lace beads in the horizontal position using 6010 and 7018 electrodes.
7. Weld stringer and weave beads in the vertical position using 6010 and 7018 electrodes.
8. Weld beads in vertical position using the whip technique and 6010 electrode.
9. Weld stringer and weave beads in the overhead position using 6010 and 7018 electrodes.
10. Weld fillet, single pass in horizontal, vertical and overhead positions using 6010 and 7018 electrodes and pass ASME break test.
11. Weld multi-pass fillets in the horizontal, vertical, and overhead positions using 6010 and 7018 electrodes. Pass break test according to AWS/ASME standards.
12. Weld square butt joint, horizontal, vertical and overhead positions, back gouge to sound metal for bend test according to AWS/ASME standards.
13. Weld single vee joint, horizontal position with E-6010 root pass, fill with E-7018, and pass bend test according to AWS/ASME standards.
14. Weld fillets in the horizontal, vertical, and overhead positions with single and multi-pass welds, and pass break test.
15. Weld open butt, outside corner joint on 1/8" plate.
16. Weld single vee-butt joint, horizontal, vertical and overhead positions, and pass bend test.

UNIT VII: Gas Tungsten Arc Welding (GTAW)

Competencies:

1. Identify safe practices for GTAW.
2. Set up gas tungsten arc welding equipment.
3. Sharpen tungsten electrode.
4. Weld open butt joint, root and hot pass, ½" plate in horizontal, vertical, and overhead positions. Pass visual test.
5. Weld open-butt joint, root and hot pass on 6" schedule 40 pipe in 2G and 5G positions. Pass visual test.

UNIT VIII: Flux-Cored Arc Welding (FCAW)

Competencies:

1. Identify safe practices for FCAW equipment.
2. Set up FCAW equipment with 100% CO_2 shield.
3. Weld a T-joint in flat, horizontal, vertical and overhead positions and pass break test according to AWS and/or ASME standards.
4. Weld open-butt joint, ½" plate, horizontal, vertical and overhead positions, root and hot pass with GTAW, fill and cap with FCAW, and pass root and face bend test according to AWS and/or ASME standards.
5. Weld open butt joint, 6" schedule 40 pipe, 2G and 5G positions, root and hot pass with GTAW, fill and cap with FCAW, pass root and face bend test according to AWS and/or ASME standards.

UNIT IX: Gas Metal Arc Welding (GMAW)

Competencies:

1. Identify safe practices for GMAW.
2. Set up equipment with 98% argon - 2% 0_2.
3. Weld open root and hot pass using dip transfer method single vee-butt joint in the horizontal, vertical and overhead positions, fill and cap with spray arc transfer in flat position. Pass root and face bend test according to AWS and/or ASME standards.

UNIT X: Materials

Competencies:

1. Identify welding materials.
2. Identify common weld defects.
3. Describe handling and storage of filler metals.
4. Describe use of welding procedures and codes.
5. Identify basic filler metals and their classification.
6. Differentiate between steel alloys and nonferrous alloys.
7. Describe methods of nondestructive testing.

UNIT XI: Blueprint Reading and Sketching

Competencies:

1. Interpret welding blueprints.
2. Identify types of lines.
3. Identify dimensioning techniques.
4. Identify and use fractions.
5. Demonstrate the ability to measure with a rule.
6. Use metrics.
7. Identify geometric shapes.
8. Use welding symbols.
9. Make a three-view sketch.
10. Make an isometric sketch.
11. Interpret pipe and instrument drawings.
12. Identify structural shapes and symbols.

UNIT XII: Fabrication Project/Qualification

Competencies:

1. Sketch part from 3-view drawing.
2. Make template from a blueprint.
3. Fabricate a part from a drawing according to welding procedures.

ADVANCED WELDING

UNIT XIII: Pipe Welding

Competencies:

1. Identify safety practices involved in pipe welding.
2. Set up pipecutting and beveling machine.

3. Weld pipe using the shielded metal arc process, downhill in the 5G position with an E-6010. Pass bend test according to American Petroleum Institute standards.
4. Weld pipe using the shielded metal arc process, E-6010 root and hot pass uphill, fill and cap with E-7018, 6G position. Pass bend test according to ASME standards.
5. Weld pipe using GTAW process, 6G position, uphill. Pass bend test according to ASME standards.
6. Fabricate a "Y" connection.
7. Weld pipe using the GMAW process, root pass, fill and cap with FCAW, and pass visual test.

UNIT XIV: Submerged Arc Welding (SAW)

Competencies:
1. Observe safety practices involved with SAW.
2. Set up SAW equipment for ¾" plate.
3. Weld beads on plate.
4. Describe fit-up requirements.
5. Weld single-vee butt joint, fill front side, gouge, fill and cap back side, and cap front side. Pass side bend test according to ASME standards.

UNIT XV: Light Gage Material—1/16" Maximum Thickness

Competencies:
1. Weld lap joint using GTAW process and GMAW process. Pass ASME peel test.
2. Weld edge joint using GTAW and GMAW processes. Pass ASME peel test.
3. Weld tee-joint using GTAW and GMAW processes. Pass ASME peel test.
4. Weld square butt joint using GTAW and GMAW processes. Pass ASME bend test.

UNIT XVI: Plasma Arc Cutting (PAC)

Competencies:
1. Identify safety practices involved with PAC.
2. Set up plasma arc gases for cutting.
3. Identify types of plasma cutting.
4. Make cuts with proper kerf.
5. Identify materials commonly cut with plasma arc.
6. Cut straight cuts.
7. Cut circle cuts.

UNIT XVII: Nonferrous Alloys

Competencies:
1. Identify nonferrous alloys.
2. Describe GTAW of aluminum.
3. Clean, prep, and fit up aluminum joints.
4. Set up GTAW machine for alternating current high frequency operation.
5. Make fillet welds on nonferrous plate in the horizontal, vertical and overhead positions. Pass ASME break test.
6. Describe GMAW of aluminum.
7. Describe welding techniques of aluminum.
8. Make fillet welds on nonferrous plate using whipping technique in the horizontal, vertical and overhead positions. Pass ASME break test.
9. Describe welding techniques for alloys.
10. Weld stainless steel and/or alloy pipe with backing gas in the 6G position. Pass visual test.

UNIT XVIII: Maintenance Welding

Competencies:
1. Identify types of cast iron.
2. Describe the weldability of cast steel.
3. Describe the weldability of cast aluminum.

4. Describe the weldability of overlay.
5. Identify hardfacing techniques.
6. Describe build-up applications.
7. Describe fit-up, cleaning and preparation for maintenance welding.
8. Describe limitations and liability of maintenance welding.
9. Repair weld cracked cast iron. Pass visual test.
10. Make an overlay and/or hardface weld. Pass visual test.

UNIT XIX: Job Seeking Skills

Competencies:

1. Develop a career plan.
2. Locate resources for finding employment.
3. Prepare a resume'.
4. Write a letter of introduction.
5. Write a letter of application.
6. Complete a job application.
7. Participate in a mock interview.
8. Write a follow-up letter.
9. Conduct a job search.